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U. S. navy dept.

REPORT

OF THE

SECRETARY OF THE NAVY;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE SECOND SESSION OF THE FIFTY-THIRD CONGRESS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

REPORT

OF

THE SECRETARY OF THE NAVY.

NAVY DEPARTMENT,
Washington, November 18, 1893.

To the PRESIDENT:

Since the date of the last report the following vessels have been launched:

Name.	Tonnage.	Date of launch.
Katahdin	2,183	Feb. 4, 1893
Indiana	10,200	Feb. 28, 1893
Massachusetts	10,200	June 10, 1893
Minneapolis	7,350	Aug. 12, 1893
Oregon	10,200	Oct. 26, 1893

The following new vessels have been completed, accepted by the Government, and placed in commission during the current calendar year:

Name.	Tonnage.	Date of commission.
Monterey	4,138	Feb. 13, 1893
Bancroft	838	Mar. 3, 1893
Machias	1,050	July 20, 1893
Detroit	2,000	....do ....
New York	8,150	Aug. 1, 1893
Castine	1,050	Not yet commissioned.

TRIALS.

The preliminary trials of the *Monterey*, *Bancroft*, *Detroit*, *New York*, *Machias*, *Castine*, and *Columbia* resulted successfully, as did also the final trials of the *Monterey*, *Bancroft*, and *Detroit*. It is a source of gratification to the Department to state that on the preliminary trials the speeds attained were, in most cases, in excess of the minimum speeds required by the several contracts, as will be seen by the following table:

Name.	Trial speed in knots per hour.	Contract speed.
		Knots.
Monterey	13.6	*5,400 16
Bancroft	14.37	12
Detroit	18.71	17
New York	21.0	20
Machias	15.46	13
Castine	15.61	13
Columbia	22.80	21

*Indicated horse power.

The increased horse power or speed over designed rates obtained by contractors in these ships has entitled them in some cases to large premiums, and this has attracted much comment. It has been assumed that these premiums when paid were mere gratuities, or that they were at any rate all clear profit to the builders, the Government being without any sufficient consideration therefor. The system of allowing premiums for increase over, and imposing penalties for failure to attain, contract rates was not thus intended, and it is not believed to have so operated.

When Secretary Whitney, who devised this method, was considering the question of making contracts, he very properly concluded that it would work hardship if he should refuse in every case to take, and should throw back upon the hands of the builder, every vessel that should fail in any respect to equal contract requirements. The natural conclusion was that if the Government did accept a ship not coming up to all the requirements, the builders should be charged for the defect according to some scale of rates previously agreed upon. This resolved itself into the imposition of penalties for failure to attain required results. The corollary, alike fair and reasonable, was premiums for excelling contract rates. Thus was devised a system which was practicable because reciprocal, and it was alike just and fair to Government and contractor. It was a double incentive to diligence, and it is not believed that it has resulted in any injustice to the Government. Ship-builders are not less shrewd than other men who conduct great business establishments; competition between them has always been severe. This statement is made with the fullest assurance of its correctness, and it may as a result be stated with equal confidence that contractors have always taken into their calculations, when bidding, the amounts it was possible to earn as premiums.

It will therefore be seen that the official trial of a vessel upon which premiums and penalties depend, is a matter of great moment both to the Government and the contractor. Elaborate preparations are always made to secure exact weights, the best of fuel, and the most efficient attendants. Contracts made prior to the incoming of the present administration provided that the Government should pay the expenses of a successful trial. When one party to a contract is to provide the means of conducting a test upon which so much depends and the other is to pay the bill it will be readily perceived that disputes will be likely to arise when settlements come to be made, and such has already been the case. Bills have been recently presented for trial trip expenses in which the Department has felt obliged to insist upon large reductions. To avoid disputes of this character, it has been provided in the recent contracts for the three new gunboats, that all trial-trip expenses shall be paid by the contractors. It is not to be doubted that bidders took this matter into consideration in making their estimates, yet it is believed that this course will result in an economy to the Government. When those who make the bills are themselves to pay them, expenditures for the trial of vessels will not be lavish.

The progress thus far made in our naval development is clearly shown in the following tables, which give the number and type of effective war vessels which this country will possess when those now building are completed, and also a similar list of vessels of the principal foreign naval powers:

UNITED STATES.

VESSELS SERVICEABLE FOR WAR PURPOSES.

Type.	Number authorized.	Number building.	Number in service.	Total.
ARMORED.				
Battle ships, first class	....	4	....	4
Battle ships, second class	....	2	....	2
Armored cruisers	....	1	1	2
Coast-defense vessels	....	4	2	6
Harbor-defense ram	....	1	....	1
Total	....	12	3	15
UNARMORED.				
Protected cruisers	....	5	8	13
Cruisers	....	2	1	3
Gunboats	3	....	6	9
Dynamite gun vessel	....	....	1	1
Total	3	7	16	26
Grand total	3	19	19	41

UNITED STATES—Continued.

VESSELS UNSERVICEABLE FOR WAR PURPOSES.

Type.	Number authorized.	Number building.	Number in service.	Total.
Iron cruisers			4	
Wooden cruisers			13	
Iron gunboats			1	
Single-turret monitors*			13	
Dispatch and practice vessels			2	
Tugs and freight boats			12	
Sailing vessels			7	
Receiving ships			9	
Vessels beyond repair			3	
Total			64	

* These monitors are in such a condition of deterioration as to be practically useless for war purposes.

Under "Miscellaneous" in the following tables are grouped transports, dispatch vessels; training, school, drill, and receiving ships; depot, survey, special-service vessels; tugs and harbor craft.

ARGENTINA.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships				1	1
Coast defense vessels				4	4
Total				5	5
UNARMORED.					
Cruisers, protected				3	3
Cruisers					
Gun vessels				12	12
Torpedo vessels				2	2
Miscellaneous		1	2	4	7
Total		1	2	21	24
Summary		1	2	26	29
Torpedo boats				26	26

AUSTRIA.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships				7	7
Coast-defense vessels		3			3
Cruisers				3	3
Gun vessels					
Total		3		10	13
UNARMORED.					
Cruisers, protected				6	6
Cruisers				12	12
Gun vessels		1		9	10
Torpedo vessels		1		6	7
Miscellaneous	1		17	12	30
Total	1	2	17	45	65
Summary	1	5	17	55	78
Torpedo boats		4		63	67

BRAZIL.

ARMORED.					
Battle ships	4			2	6
Coast-defense vessels			1	3	4
Cruisers					
Gun vessels		2	4		6
Total	4	2	5	5	16
UNARMORED.					
Cruisers, protected	6	1		2	9
Cruisers			1	5	6
Gun vessels			23	0	23
Torpedo vessels	6			1	7
Miscellaneous		1	12	4	17
Total	12	2	36	12	62
Summary	16	4	41	17	78
Torpedo boats				15	15

CHILE.

ARMORED.					
Battle ships				2	2
Coast-defense vessels				1	1
Total				3	3
UNARMORED.					
Cruisers, protected	1	1		3	5
Cruisers			1	4	5
Gun vessels					0
Torpedo vessels	2			2	4
Miscellaneous	2		2	6	10
Total	5	1	3	15	24
Summary	5	1	3	18	27
Torpedo boats	Some			21	21

CHINA.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships	....	....	....	2	2
Coast-defense vessels	....	....	....	4	4
Total	....	....	....	6	6
UNARMORED.					
Cruisers, protected	....	7	....	6	13
Cruisers	....	5	2	13	20
Gun vessels	....	....	4	44	48
Torpedo vessels	....	1	....	....	1
Miscellaneous	....	....	27	18	45
Total	....	13	33	81	127
Summary	....	13	33	87	133
Torpedo boats	....	....	....	32	32

DENMARK.

ARMORED.					
Battle ships	....	....	....	1	1
Coast-defense vessels	....	1	....	6	7
Cruisers	....	....	....	1	1
Total	....	1	....	8	9
UNARMORED.					
Cruisers, protected	....	....	....	5	5
Cruisers	....	....	....	1	1
Gun vessels	....	....	....	11	11
Torpedo vessels	....	....	....	0	0
Miscellaneous	....	....	8	15	23
Total	....	....	8	32	40
Summary	....	1	8	40	49
Torpedo boats	....	2	....	20	22

ENGLAND.

ARMORED.					
Battle ships	2	6	....	36	44
Coast-defense vessels	....	....	....	18	18
Cruisers	....	....	3	19	22
Total	2	6	3	73	84
UNARMORED.					
Cruisers, protected	5	12	....	46	63
Cruisers	....	....	1	68	69
Gun vessels	....	....	....	82	82
Torpedo vessels	....	8	....	31	39
Miscellaneous	....	....	130	114	244
Total	7				
Summary	9				
Torpedo boats					

FRANCE.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships	3	5	3	18	29
Coast-defense vessels	....	4	1	21	26
Cruisers	....	7	3	9	19
Total	3	16	7	48	74
UNARMORED.					
Cruisers, protected	6	11	....	19	36
Cruisers	....	....	2	28	30
Gun vessels	4	1	2	87	94
Torpedo vessels	....	3	....	11	14
Miscellaneous	....	....	119	244	363
Total	10	15	123	389	537
Summary	13	31	130	437	611
Torpedo boats	10	33	....	180	223
Torpedo boats (submarine)	....	2	....	1	3

GERMANY.

ARMORED.					
Battle ships	....	4	....	10	14
Coast-defense vessels	....	6	....	13	19
Gun vessels	....	....	....	2	2
Total	....	10	....	25	35
UNARMORED.					
Cruisers, protected	....	1	....	3	4
Cruisers	1	2	....	14	17
Gun vessels	....	....	....	3	3
Torpedo vessels	2	4	....	12	18
Miscellaneous	....	....	38	24	62
Total	3	7	38	56	104
Summary	3	17	38	81	139
Torpedo boats	8	8	....	109	125
Torpedo boats (submarine)	1	....	....	....	1

GREECE.

ARMORED.					
Battle ships	1	....	....	3	4
Cruisers	....	....	....	2	2
Total	1	....	....	5	6
UNARMORED.					
Cruisers, protected	3	2	....	....	5
Cruisers	....	....	....	4	4
Gun vessels	....	....	....	16	16
Torpedo vessels	2	....	....	1	3
Miscellaneous	....	....	9	13	22
Total	5	2	9	34	50
Summary	6	2	9	39	56
Torpedo boats	25	....	....	23	48

HOLLAND.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships					
Coast-defense vessels	3			25	28
Total	3			25	28
UNARMORED.					
Cruisers, protected				1	1
Cruisers				11	11
Gun vessels		1		55	56
Torpedo vessels		4			4
Miscellaneous			11	35	46
Total		5	11	102	114
Summary	3	5	11	127	142
Torpedo boats		3		38	41

ITALY.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships		5		7	12
Coast-defense vessels				6	6
Cruisers	2	2		4	8
Total	2	7		17	26
UNARMORED.					
Cruisers, protected		7		6	13
Cruisers		1		12	13
Gun vessels				32	32
Torpedo vessels	3	2		13	18
Miscellaneous	3			67	70
Total	6	10		130	146
Summary	8	17		147	172
Torpedo boats		19		160	179
Torpedo boats (submarine)		1		1	2

JAPAN.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships					
Coast-defense vessels				3	3
Cruisers				2	2
Total				5	5
UNARMORED.					
Cruisers, protected		4	1	6	11
Cruisers				8	8
Gun vessels				7	7
Torpedo vessels				1	1
Miscellaneous			5	6	11
Total		4	6		38
Summary		4	6		43
Torpedo boats					

PORTUGAL.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships					
Coast-defense vessels				1	1
Cruisers		4			4
Total		4		1	5
UNARMORED.					
Cruisers, protected					
Cruisers				6	6
Gun vessels		2		30	32
Torpedo vessels					
Miscellaneous			8	16	24
Total		2	8	52	62
Summary		6	8	53	67
Torpedo boats		5		4	9

RUSSIA.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships		5		10	15
Coast-defense vessels		2		27	29
Cruisers	1	1		9	11
Total	1	8		46	55
UNARMORED.					
Cruisers, protected				1	1
Cruisers				28	28
Gun vessels				35	35
Torpedo vessels		1		11	12
Miscellaneous	10	3		70	83
Total	10	4		145	159
Summary	11	12		191	214
Torpedo boats		14		152	166

SPAIN.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED.					
Battle ships				1	1
Coast-defense vessels				5	5
Cruisers		7			7
Total		7		6	13
UNARMORED.					
Cruisers, protected				6	6
Cruisers				15	15
Gun vessels				28	28
Torpedo vessels		3		8	11
Miscellaneous			19	45	64
Total		3	19	102	124
Summary		10	19	108	137
Torpedo boats		24		24	48
Torpedo boats (submarine)		1		1	2

SWEDEN AND NORWAY.

Type.	Number authorized.	Number building.	Number unfit for effective service.	Number available for war service.	Total number.
ARMORED (SWEDEN).					
Battle ships					
Coast-defense vessels				16	16
ARMORED (NORWAY).					
Battle ships					
Coast-defense vessels				4	4
Total, Sweden				16	16
Total, Norway				4	4
Total, Sweden and Norway				20	20
UNARMORED (SWEDEN).					
Cruisers, protected					
Cruisers				4	4
Gun vessels				13	13
Torpedo vessels				1	1
Miscellaneous			3	28	31
UNARMORED (NORWAY).					
Cruisers, protected				1	1
Cruisers				2	2
Gun vessels				31	31
Torpedo vessels					
Miscellaneous			9	5	14
Total, Sweden			3	46	49
Total, Norway			9	39	48
Total Sweden and Norway			12	85	97
Summary, Sweden			3	62	65
Summary, Norway			9	43	52
Summary, Sweden and Norway			12	105	117
Torpedo boats:					
Sweden				20	20
Norway		2		9	11
Total Sweden and Norway		2		29	31

TURKEY.

ARMORED.					
Battle ships	2			7	9
Coast-defense vessels				4	4
Cruisers		1		7	8
Total	2	1		18	21
UNARMORED.					
Cruisers, protected	2	2			4
Cruisers	2	2			7
Gun vessels	16	8			
Torpedo vessels					
Miscellaneous					
Total	20				
Summary	22				
Torpedo boats					
Submarine boats					

A comparison of these tables will show that the United States now ranks seventh as a naval power.

Of the old wooden ships of the Navy but eight remain in active service as cruisers, and one, the *Hartford*, is now being repaired for service. These vessels will disappear from active service within three years under the operations of the 10 per cent limit, except the *Hartford* and the *Kearsarge*, which are specially exempted by act of Congress. None of our wooden vessels can be taken into account in the consideration of an effective Navy.

After careful consideration, the Department requests authority to devote the $450,000 authorized for the construction of a vessel similar to the *Vesuvius* to the construction of three torpedo boats; and it also recommends that Congress should so increase the limit of cost of the swift torpedo cruiser authorized by the act of June 30, 1890, as to enable the Department to have this vessel laid down during the next fiscal year.

PROPOSALS FOR NEW VESSELS.

The act of Congress entitled "An act making appropriations for the naval service for the fiscal year ending June 30, 1894, and for other purposes," approved March 3, 1893, authorized the construction of three new vessels, these vessels to be of the class known as "light-draft protected gunboats," of about 1,200 tons displacement, and to cost not more than $400,000 each, excluding any premiums that may be paid for increased speed and cost of armament. The act further provided that the contract for the construction of either of said gunboats shall contain such provisions as to speed, and premiums and penalties affected by speed, as, in the judgment of the Secretary of the Navy, may be deemed proper and fitting.

Under authority conferred by the act above mentioned, sealed proposals were invited for the construction of these vessels, which, for the purpose of distinguishing them, were designated as Gunboats Nos. 7, 8, and 9, under two general classes, each class embracing all three vessels. In Class 1 the "hull and machinery, including engines, boilers, and appurtenances and equipment, complete in all respects, in accordance with the drawings, plans, and specifications provided by the Secretary of the Navy." Class 2, the "hull and machinery, including engines, boilers, and appurtenances and equipment, complete in all respects, in accordance with the drawings, plans, and specifications provided by the bidder."

Two designs were determined upon by the Department; the one for No. 7 being that of a light-draft protected gunboat of about 1,200 tons displacement, having a speed of 14 knots per hour; and that for Nos. 8 and 9, being of a light-draft protected gunboat for special service, having a speed of 13 knots per hour. These vessels are designed for use in Chinese waters and for river service elsewhere.

Plans, drawings, and specifications were prepared by the Department ready for the inspection of all persons desiring to bid under Class 1, and the sealed proposals under both classes were opened October 17, 1893.

The bids under the two classes were found to be as follows:

CLASS 1.

Name of bidder.	Gunboat No. 7.	Gunboat No. 8 or 9.	Gunboats No. 8 and No. 9.	
			Each.	Total.
Maryland Steel Company, Sparrow Point, Md	$380,000	$380,000	$375,000	$750,000
Union Iron Works, San Francisco, Cal	400,000	385,000	350,000	700,000
Newport News Shipbuilding Company, Newport News, Va	290,000	300,000	287,500	575,000
Coronado Foundry and Machine Company, Coronado, San Diego County, Cal	372,000	....	....	....
Bath Iron Works, Bath, Me	425,000	468,000	....	....

Name of bidder.	Gunboats No. 7 and No. 8 or No. 9.			Gunboats No. 7 and No. 8 and No. 9.		
	No. 7.	No. 8 or 9.	Total.	No. 7.	No. 8 or 9.	Total.
Maryland Steel Company, Sparrow Point, Md	$379,000	$379,000	$758,000	$370,000	$370,000	$1,110,000
Union Iron Works, San Francisco, Cal.	400,000	380,000	780,000	400,000	350,000	1,100,000
Newport News Shipbuilding Company, Newport News, Va	292,500	292,500	585,000	280,000	280,000	840,000
John H. Dialogue & Son, Camden, N.J.	....	....	....	395,333⅓	395,333⅓	1,186,000

CLASS 2.

Name of bidder.	Gunboat No. 7.	Gunboat No. 8 or 9.	Gunboats No. 8 and No. 9.	
			Each.	Total.
Union Iron Works, San Francisco, Cal	....	$377,000	$342,000	$684,000
Bath Iron Works, Bath, Me	$368,000	382,000	377,000	754,000

Name of bidder.	Gunboats No. 7 and No. 8 or No. 9.			Gunboats No. 7 and No. 8 and No. 9.		
	No. 7.	No. 8 or 9.	Total.	No. 7.	No. 8 or 9.	Total.
Union Iron Works, San Francisco, Cal.	....	....	....	$400,000	$342,000	$1,084,000

These bids are very much lower than any ever heretofore received by the Government, but before accepting any of them the Department is having all the plans examined by a second board. This board is expected to report during the coming week, and the contracts will probably be awarded before Congress convenes.

CONSTRUCTION OF SHIPS.

The difficulty experienced until recently in procuring armor has caused long and unlooked-for delays in the construction of armored vessels. Secretary Whitney, on the 1st day of June, 1887, contracted with the Bethlehem Company for the armor required for the construction and completion of four monitors, the *Puritan*, *Terror*, *Monadnock*, and *Amphitrite*, and two second-class battle ships, the *Maine* and the *Texas*. Three hundred tons were to be ready by February 1, 1890, and deliveries were to be made thereafter at the rate of 300 tons per month. Deliveries under this contract were to commence in January, 1890, and be completed in September, 1891. Had the contract been complied with, all the above ships might have been in commission at the present time. As it is, none of them are completed. Three first-class battle ships having been in the meantime authorized by Congress, Secretary Tracy, on the 20th day of November, 1891, contracted with Carnegie & Co. for 6,300 tons of armor. Deliveries were to begin July 1, 1891, and be completed about April 1, 1892.

Of the 12,300 tons covered by the two contracts, only 1,949 tons had been delivered on the 1st day of March last. When new industries are inaugurated time is required to perfect plants, and these can not be operated successfully without experience. Our armor-makers have encountered even greater difficulties than they anticipated, but these have all been overcome, and deliveries of armor are now being made with satisfactory rapidity.

Modern shipbuilding itself may almost be said to be a new industry in this country, and delays have sometimes, though rarely, resulted from the want of experience in builders. More frequently contractors for material have failed to make prompt deliveries. Then, too, it always happens that changes and additions are determined upon and ordered while vessels are in process of construction. These alterations are not only the cause of vexatious delays, but are attended with more or less expense. The necessity for changes often arises from undue haste in the preparation of plans, but experience has proved that no amount of care or skill can entirely obviate it. Complaints are made in the British House of Commons, just as here, that constructors vary the plans of vessels as they progress.

There is probably no ground for believing that we shall ever construct a vessel without making some changes in its plans while building, but to reduce this evil to a minimum, I have enjoined the utmost caution upon the designers of the three new gunboats authorized by the last Congress. It is hoped that deliberation in the construction of plans will achieve better and even speedier results than would come from any effort to expedite them.

Surveying the whole field, we find much to be proud of in the knowledge that we can now furnish the material for, and build, modern ships of war as quickly and, without any doubt, as well as any country in the world. I feel confident that some of our shipyards rival the best in Europe.

The work of construction on the coast-defense battle ships *Indiana* and *Massachusetts*, of 10,200 tons each, is progressing satisfactorily. The former vessel is the more advanced toward completion, and it is anticipated that she will be ready for trial by June of the coming year.

The coast-defense battle ship *Oregon*, of 10,200 tons, has been launched, and work is being pushed on her as rapidly as possible.

Work on the protected cruisers *Columbia* and *Minneapolis*, of 7,350 tons each, is being rapidly pushed. It is expected that the former vessel will be ready for commissioning in a short time.

The second-class battle ship *Maine*, of 6,648 tons, has had a trial of her engines, and her armor is now being put in place. It is expected that she will be ready for a sea trial in about six months.

The work on the second-class battle ship *Texas*, of 6,300 tons, is progressing as rapidly as possible, and the vessel will probably be ready for her sea trial within six months.

The progress of work on the double-turreted monitor *Puritan*, of 6,060 tons, is satisfactory, and it is expected that the vessel will be ready for trial about July 1, next.

The double-turreted monitors *Terror*, *Amphitrite*, and *Monadnock*, of 3,990 tons each, are approaching completion in the order named. It is believed that they will all be ready for trial during the first half of the next year.

The protected cruiser *Olympia*, of 5,500 tons, will have her trial trip within the coming week.

Work on the protected cruisers *Cincinnati* and *Raleigh*, of 3,183 tons each, is progressing with as much dispatch as possible, and both vessels will be ready for trial by March next.

The cruiser *Marblehead*, of 2,000 tons, is so far advanced that the Department expects that her acceptance trial will take place within a short time.

The cruiser *Montgomery*, of 2,000 tons, was taken to Long Island Sound in October last for her trial trip and was accidentally run aground before the trial began. The heavy shock sustained from her contact with the rugged bottom caused injuries which will not be repaired for some weeks to come. The accident, however, resulted in demonstrating the excellence of the material of which she is built. The contractors, in whose hands she was at the time, and who were responsible for the mishap, are making the necessary repairs.

The armored harbor-defense ram *Katahdin*, of 2,183 tons, will be ready for trial about January 1, 1895, by which date it is expected that her armor will have been delivered and bolted in place.

The torpedo boat *Ericsson* should be completed by the end of the present fiscal year.

The seagoing battle ship *Iowa*, of 11,296 tons, will be completed, from present indications, by February 1, 1896; and the armored cruiser *Brooklyn*, of 9,150 tons, about six months later.

The progress of development in the construction of the vessels of the new Navy heretofore authorized is thus shown to be so well advanced as to make it possible to give a definite idea of the cost to the Government, in consequence of which I herewith submit the following tables of details of cost of completed and uncompleted vessels of the Navy up to the beginning of the present fiscal year.

Taking into consideration the fact that almost all of the details of this construction were new to our designers, manufacturers, and workmen, I am sure you will be convinced that the work has been carried on without extravagance, and to the best interests of the Government.

Statement showing the Name and Tonnage of each Vessel that has been completed since March 4, 1885; when Authorized to be Built, when Begun, and when Commissioned; its entire Cost of Construction, including Armor, Armament, Equipment, and Premiums, and its cost for Repairs since Completion up to June 30, 1893.

Name.	Tonnage.	When authorized to be built.	When begun.	When commissioned.	Cost of construction.	Armament.	Outfit under steam engineering, construction, and equipment.	Premiums.	Total cost of construction, including armament, equipment, and premiums.	Expended for repairs since completion.
Chicago	4,500	Mar. 3, 1883	July 26, 1883	Apr. 17, 1889	*$1,183,629.21	$292,257.50	$111,936.71	....	$1,587,823.42	$108,606.11
Atlanta	3,189	....do	July 23, 1883	July 19, 1886	*700,000.00	177,912.75	95,480.99	....	973,393.74	95,702.34
Boston	3,189	....do	....do	May 2, 1887	*700,000.00	178,280.89	88,248.45	....	966,529.34	88,600.81
Dolphin	1,485	....do	....do	Dec. 8, 1885	*350,000.00	34,278.79	37,715.68	....	421,994.47	102,819.52
Newark	4,083	Mar. 3, 1885	Oct. 27, 1887	Feb. 2, 1891	1,379,897.47	169,448.22	115,695.80	$36,857.70	1,701,899.19	28,058.25
Charleston	4,044	....do	Dec. 28, 1886	Dec. 26, 1889	1,164,504.10	181,954.05	121,500.55	....	1,467,958.70	65,847.07
Yorktown	1,700	....do	Jan. 31, 1887	Apr. 23, 1889	498,305.45	114,247.78	60,095.36	39,825.00	712,473.59	71,576.64
Petrel	890	....do	Dec. 22, 1886	Dec. 10, 1889	307,996.55	51,280.37	70,033.79	....	429,310.71	24,521.53
Baltimore	4,600	Aug. 3, 1886	Dec. 17, 1886	Jan. 7, 1890	1,426,504.93	209,294.92	118,446.91	106,441.80	1,860,688.56	72,443.17
Vesuvius	725	....do	Feb. 11, 1887	June 7, 1890	317,555.33	....	8,020.40	....	325,575.73	23,328.98
Cushing	116	....do	Mar. 1, 1888	Apr. 22, 1890	98,666.29	....	1,809.95	....	100,476.24	14,843.98
Philadelphia	4,324	Mar. 3, 1887	Oct. 27, 1887	July 28, 1890	1,424,864.85	196,298.62	98,386.04	100,000.00	1,819,549.51	67,477.96
San Francisco	4,083	....do	Oct. 26, 1887	Nov. 15, 1890	1,609,745.71	183,471.70	120,233.81	100,000.00	2,013,451.22	32,406.03
Concord	1,700	....do	Nov. 15, 1887	Feb. 14, 1891	553,117.66	81,888.42	66,846.93	382.04	702,235.05	45,020.03
Bennington	1,700	....do	....do	June 20, 1891	553,875.55	80,328.11	64,513.25	3,410.43	702,127.34	15,772.18
Miantonomoh †	3,990	....do	Aug. 13, 1887	Oct. 27, 1891	619,851.43	227,252.22	39,068.17	....	886,171.82	43,298.54
Monterey	4,048	....do	June 14, 1889	Feb. 13, 1893	2,065,779.30	337,127.19	‡ 55,000.00	....	2,457,906.49	490.32
New York	8,150	Sept. 7, 1888	Aug. 28, 1890	Aug. 1, 1893	3,249,224.45	268,442.00	‡ 55,000.00	200,000.00	3,772,666.45	....
Detroit	2,000	....do	Nov. 2, 1889	July 20, 1893	579,784.62	116,802.33	‡ 50,000.00	....	746,586.95	....
Machias	1,050	Mar. 2, 1889	Apr. 12, 1890	....do	342,822.99	83,961.00	‡ 45,000.00	....	471,783.99	....
Castine	1,050	....do	....do	Oct. 16, 1893§	‖ 299,894.29	83,961.00	‡ 45,000.00	....	428,855.29	....
Bancroft	838	Sept. 7, 1888	July 18, 1890	Mar. 3, 1893	297,360.17	38,521.99	15,013.16	....	350,895.32	576.24

Tug boat Wahneta	192.4	Mar. 2, 1889	Dec. 20, 1890	Apr. 16, 1892¶	33, 176. 52				33, 176. 52	85. 96
Tug boat Iwana	192.4	....do	....do	May 4, 1892¶	33, 253. 57				33, 253. 57	2, 144. 08
Tug boat Narkeeta	192.4	....do	....do	Apr. 14, 1892¶	33, 648. 91				33, 648. 91	6, 388. 49
Total					19, 823, 459. 35	3, 107, 009. 85	1, 483, 045. 95	586, 916. 97	25, 000, 432. 12	910, 008. 83

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* Cost and valuation by appraisement June 29, 1889 (and including in the case of the Chicago $33,629.21 additional expenditures for completion since appraisement).

† The cost of the Miantonomoh in this table includes the expenditures incurred subsequent to the passage of the act of March 3, 1887, authorizing its reconstruction. The expenditures made prior to March 3, 1887, were $1,482,900.79.

‡ Estimated; final returns not received up to June 30, 1893.

‖ Entire payments not yet made.

§ Delivered over.

¶ Completed.

STATEMENT SHOWING THE NAME AND TONNAGE OF EACH UNCOMPLETED VESSEL AUTHORIZED TO BE BUILT SINCE MARCH 4, 1885, WHEN AUTHORIZED TO BE BUILT, WHEN BEGUN, THE PROBABLE DATE OF ITS COMPLETION, COST OF CONSTRUCTION (INCLUDING ARMOR AND ARMAMENT, TO JUNE 30, 1893.

Name.	Tonnage.	When authorized to be built.	When begun.	Probable date of completion.	Expended in construction (exclusive of armament).	Expended by Bureau of Ordnance for armament in process of manufacture.	Total amount expended upon construction, including armor and armament.
Maine	6,648	Aug. 3, 1886	Nov. 5, 1887	Sept. 1, 1894	$2,486,746.92	$305,210.00	$2,791,956.92
Texas	6,300	....do	Nov. 8, 1887	June 30, 1894	2,049,085.92	193,264.00	2,542,349.92
Olympia	5,500	Sept. 7, 1888	July 10, 1890	Dec. 1, 1893	1,466,518.86	188,860.00	1,655,378.86
Cincinnati	3,183	....do	Sept. 26, 1889	Jan. 15, 1894	1,505,305.86	100,535.00	1,605,840.86
Raleigh	3,183	....do	....do	Jan. 1, 1894	1,645,562.64	100,535.00	1,746,097.64
Montgomery	2,000	....do	Nov. 2, 1889	Mar. 1, 1894	585,436.21	141,888.00	727,324.21
Marblehead	2,000	....do	Nov. 11, 1889	Jan. 30, 1894	626,460.18	141,888.00	768,348.18
Katahdin	2,050	Mar. 2, 1889	Jan. 22, 1891	Apr. 1, 1895	635,071.05	....	635,071.05
Indiana	10,200	June 30, 1890	Nov. 19, 1890	Oct. 1, 1894	2,278,740.07	384,440.00	2,663,180.07
Massachusetts	10,200	....do	....do	Apr. 1, 1895	2,193,692.53	275,940,00	2,469,632.53
Oregon	10,200	....do	....do	Oct. 1, 1895	1,709,453.82	36,940.00	1,746,393.82
Columbia	7,400	....do	....do	Feb. 1, 1894	2,169,330.18	111,328.00	2,280,658.18
Ericsson (Torpedo Boat No. 2)	112	....do	Oct. 8, 1891	June 30, 1894	69,600.81	....	69,600.81
Minneapolis	7,350	Mar. 3, 1891	Aug. 31, 1891	Aug. 1, 1894	1,726,501.84	58,684.00	1,785,185.84
Puritan *	6,600	Aug. 3, 1886	June 26, 1889	July 1, 1894	476,465.09	387,590.00	864,055.09
Monadnock †	3,990	....do	Mar. 26, 1890	Aug. 1, 1894	697,255.27	173,170.00	870,425.27
Amphitrite ‡	3,990	....do	Aug. 30, 1889	Apr. 1, 1894	590,029.74	173,170.00	763,199.74
Terror §	3,990	....do	Apr. 25, 1889	Feb. 15, 1894	677,380.15	308,543.00	985,923.15
Iowa	11,296	July 19, 1892	Feb. 11, 1893	Oct. 1, 1896	18,373.56	....	18,373.56
Brooklyn	9,153	....do	....do	Feb. 1, 1896	10,153.45	....	10,153.45

Gunboat No. 7	1,750	Mar. 3, 1893	(11)	Jan. 1, 1896	639.17		639.17
Gunboat No. 8	1,600	....do	(11)	....do	639.17		639.17
Gunboat No. 9	1,600	....do	(11)	....do	629.16		629.16
Total					23,619,071.65	3,081,985.00	26,701,056.65

[11] Contracts not yet awarded.

Note.—The cost of the monitors stated in this table includes the expenditures incurred subsequent to the passage of the act of August 3, 1886, authorizing their reconstruction. The expenditures made prior to August 3, 1886, were as follows:

* Puritan	$981,762.46
† Monadnock	622,705.87
‡ Amphitrite	577,231.67
§ Terror	599,850.53
Total	2,781,550.53

ORDNANCE.

The production of modern high-power guns at the Washington factory is progressing satisfactorily. The gun plant at this establishment is not surpassed by any in the world, and increased experience has resulted during the past year in still greater economy in all branches of manufacture. Up to the present time there have been completed for service 237 guns, ranging in caliber from 4-inch to 13-inch, all of which have not only proved successful upon trial, but have also given results which show conclusively that the general system of construction employed has no superior in foreign countries.

For the new vessels thus far authorized main battery guns will be required as follows:

Caliber of gun.	Number of forgings.		Number of guns completed to date.	Number of guns partly completed.	Number of guns afloat.
	Ordered.	Delivered.			
4-inch	107	77	55	20	34
5-inch	86	66	37	19	26
6-inch	141	141	135	6	96
8-inch	68	52	33	19	20
10-inch	26	25	25	....	10
12-inch	13	8	8	....	2
13-inch	12	9	5	3	....
Total	453	368	298	67	188

None of the 13-inch guns have been tested up to the present time, as their mounts have not yet been completed.

The possession of new and improved gun lathes has permitted of so great an improvement in the process of construction that the time required from the rough boring of the tube of a 12-inch gun to the rifling and lapping has been reduced from ten to six and a half months, with the gratifying result of reducing the cost of labor over 30 per cent.

The maximum caliber of guns building is 13 inches. In the past guns have been built for the main batteries of battle ships abroad of a caliber as high as 16.75 inches, and weighing over 100 tons, but practical experience under service conditions afloat has proved them undesirable for naval use.

At the present time the weight of foreign naval opinion is in favor of guns of not more than 12-inch caliber, and weighing not more than 50 tons. These guns, owing to greater length of bore and the use of more powerful slow-burning powder of the smokeless variety, give almost as good results as the larger guns above referred to, and this, taken in connection with the great danger of accident to the mechanical devices used to manipulate the larger high-powered guns, has operated to cause a demand for a gun of the maximum weight that can be readily handled by man power. Information in possession of the Department leads to the belief that this policy is now that of the leading nations abroad. In England the largest guns for naval use under construction at the present time are of 12-inch caliber, 40 calibers in length, weighing 50 tons; in France, 11.8 caliber and 45 calibers in length.

The last of the 10-inch guns authorized have been completed during the year. The breech mechanism of these guns has undergone important modifications, by which its weight has been materially reduced without any diminution of strength.

The forgings for an 8-inch nickel-steel gun have been machined and are ready for assembling. When completed the gun will be subjected to exhaustive trials, with the expectation that this new departure, which combines the employment of a material never heretofore used in gun construction, with an entirely new process of assembling, will give results of increased efficiency at a greatly reduced cost of manufacture.

The remaining 6 guns of 6-inch caliber, which are now in an advanced stage of completion, are to be fitted as rapid-fire guns.

All the 5-inch guns are to be of 40 calibers.

The improved hand-working breech mechanism referred to in the last report, having successfully withstood exhaustive tests, has been adopted for all guns of 8-inch caliber and above.

For the secondary batteries, 480 guns have thus far been ordered, the type and number being as follows:

Gun.	Kind.	Number ordered.	Number completed.	Ordered but not delivered.	Number afloat.
37-millimeter	Hotchkiss	49	49		32
47-millimeter	do	14	14		6
1-pounder	do	91	66	25	46
1-pounder	Driggs	15		15	
3-pounder	Hotchkiss	36	36		33
3-pounder	Driggs	10	10		2
6-pounder	Hotchkiss	150	150		56
6-pounder	Driggs	115	35	80	29
Total		480	360	120	204

The general tendency with the principal foreign powers is not only towards the installation on war vessels of as many rapid-firing and machine guns as can be properly protected, but also towards the extension of the rapid-firing system to guns of higher calibers.

GUN MOUNTS.

During the past year the 10-inch and 12-inch guns of the *Monterey* have been carefully tested under ordinary service conditions, and their mounts found to work successfully. This fact has led the Department to adopt the same type for the 13-inch mounts of the battle ships. Three of these 13-inch mounts are now in course of construction; the castings for the remainder have been contracted for and will soon be delivered. The 12-inch mounts for the *Puritan* and *Texas* are well under way and will be completed by the time the vessels are ready to receive them. One of these mounts has passed a successful test at the naval proving ground. The 10-inch gun mounts for the *Maine* are practically ready, and those for the *Amphitrite* and *Monadnock* are in an advanced stage.

The pneumatic mounts for the *Terror* have been completed and are now awaiting trial.

A new type of 8-inch carriage has been designed, which, it is hoped, will prove superior to those now in service. In this new design the guns will recoil in the line of fire, and return to battery by springs, a method very similar to that used in the smaller rapid-fire carriages. It is expected that this new arrangement will reduce the downward thrust on the decks to a minimum, and will very much lessen the exposure of the gun crew to small-arm and machine-gun fire by materially reducing the size of the large ports of turrets and gun shields.

POWDER.

The Department is pleased to state that a new source of powder supply is now assured on the Pacific coast. During the past year the first lot of brown powder, manufactured by the California Powder Company of Santa Cruz, Cal., was received. The lot was for use with the 6-inch gun, and has been tested with most gratifying results.

The manufacture of smokeless powder at the naval torpedo station, at Newport, R. I., has been continued during the past year with promising results, but the Department considers that this manufacture is still in the experimental stage. If further developments demonstrate its success under service conditions, it will be issued for use on board ship without delay.

HIGH EXPLOSIVES.

Emmensite and the nitrate high explosives referred to in the last report have been experimented with during the year and successfully fired from high-power guns up to and including the 6-inch caliber. A detonating fuse has been used in the shells charged with emmensite, with which excellent results were obtained.

The Duponts have completed their order for 50,000 pounds of gun cotton, which has proved to be of excellent quality. With this source of supply, and that of the torpedo station at Newport, R. I., there is no doubt that the demands of the Navy can be met at any time.

The manufacture of gun cotton has been continued at the torpedo station with marked success, and during the year exhaustive experiments in the manufacture of smokeless powder have been conducted at that place.

PROJECTILES.

The manufacture of armor-piercing
well established. Of those heretofo

under contract by the Carpenter Steel Company, of Reading, Pa., and the Sterling Steel Company, of Delmar, Pa., 9,665 of various calibers have been ordered, of which 4,689 have been delivered up to date. Exhaustive tests of these shells show conclusively that they are equal, if not superior, to any armor-piercing shell manufactured abroad. The advent of Harveyized nickel-steel armor, however, has so changed the conditions of attack as to render the higher development of armor-piercing projectiles absolutely essential. This necessity has been clearly established by experiments at the naval proving grounds this year, where, in angular fire against curved nickel-steel plates, it was demonstrated that armor-piercing projectiles would not penetrate at an angle of 45 degrees, and that at even smaller angles of impact armor-piercing projectiles were liable to break up. This matter is now receiving the serious attention of the Bureau of Ordnance.

In this connection, during the past year, forged steel shells for the smaller calibers have been treated with the Harvey process, greatly enhancing their armor-piercing qualities.

During the last few months private firms have evidenced their ability to supply wrought-steel shells of such an excellent quality that the Department has deemed it advisable to discontinue the manufacture of cast-iron projectiles.

Steel shells, fitted with base fuses, for the 4-inch, 5-inch, and 6-inch guns, manufactured by the United States Projectile Company have proved very satisfactory, carrying their bursting charges through steel plates half a caliber in thickness without breaking up the shells.

SMALL ARMS.

The progress made in the development of small arms abroad during the last seven years has reached such a point that the Department has become convinced that the time has arrived for a change in the small-arm rifle now in use in the Navy. With this end in view a board of naval officers was appointed in July of this year to first consider and decide upon the caliber, and then to test and submit the small arms best suited to the naval service.

Since the introduction of smokeless powder, in 1886, small-arm experts have been fully alive to the great tactical advantages of a reduction in caliber, and foreign nations have experimented with rifles of various designs with the object of overcoming the mechanical disadvantages incidental to manufacture. As a result the principal civilized nations, with the exception of the United States, are to-day using magazine rifles varying in caliber from ".315 to ".256, which employ charges of smokeless powder giving muzzle velocities of 2,000 foot
onds and over and effective ranges of not less than 2,000 yards—
er a mile. Exhaustive trials of these rifles have clearly demon-
ed their great superiority in ballistic and tactical qualities over
o time rifles of large caliber.

The arm at present in use in the Navy is the ″.45 caliber, employing a charge of black powder, giving a muzzle velocity of 1,250 foot seconds, with an effective range of only 1,200 yards. The weight of its ammunition is such that but 55 rounds can be carried per man.

After careful deliberation and research, taking into consideration the actual necessities of our own naval service, the board recommended a magazine rifle of ″.236 caliber, to use a smokeless powder which will give a muzzle velocity of 2,400 foot seconds, an effective range of a mile and a half, and employing cartridges of such a weight as to permit not less than 200 rounds to be carried per man.

This rifle will be of a smaller caliber than that now in use by any other power. The Department has approved the recommendation of the board, in the expectation that it will result in giving the U. S. Navy a rifle with ballistic and tactical qualities superior to those of any other small arm now in actual service, or adopted and in course of construction.

The following table gives details of the small arms either adopted or now in use by the principal foreign powers:

Country.	Type.	Name.	Caliber.	Weight of charge.	Weight of bullet.	Number cartridges carried per man.	Weight of ammunition carried.
			Inches.	*Grains.*	*Grains.*		*Pounds.*
United States Navy (proposed).	Magazine.	....	0.236	33	135	200	9.0
Austria	....do	Mannlicher	.315	42.5	244	150	9.7
Belgium	....do	Mauser	.301	47	219	150	8.6
England	....do	Lee-Metford	.303	....	216	116	7.1
France	....do	Lebel	.315	43	231.5	120	6.5
Germany	....do	Mannlicher	.311	42.5	223-226	150	8.9
Holland	....do	....do	.256	32.1	162	160	9.4
Italy	....do	Mannlicher-Carcano.	.256	29.3	161	200	9.5
Roumania	....do	Mannlicher	.256	32.1	162	200	9.5
Russia	....do	Mouzin	.30	33	213 208	150	7.7
Switzerland	....do	Schmidt	.295	30	215	100	6

It is the intention of the Department to manufacture barrels and ammunition for this caliber, and then to call upon inventors to submit small arms of their own designs for competitive tests, the finished barrels and ammunition to be supplied by the Bureau of Ordnance at cost price. The Department has become satisfied that no difficulty will be found in adapting the Gatling or any other machine gun to the 0″.236 caliber.

TORPEDOES.

Thirty Howell torpedoes were originally contracted for, with the option of increasing the number to fifty or more. Seven torpedoes of this type have been presented for official trial, and the balance are ready for assembling. Their performance, in regard to speed and accuracy, up to a range of 400 yards, was most satisfactory, but, unfortunately, after two weeks of trial, the torpedo boat from which the tests were conducted broke down, thus necessitating postponement of the trials until repairs could be made to the boat.

Of the Whitehead torpedoes fifty of those contracted for have been tested and accepted. It is gratifying to state that although the requirements of the specifications for the tests of these torpedoes were exceptionally severe, the trials resulted in the acceptance of the entire lot, and all are considered to be equal in every respect to those made abroad. The remainder of the one hundred contracted for and ready for assembling will be delivered as rapidly as they can be tested.

The contractor's plant is now capable of furnishing all the torpedoes and launching apparatus the Department may see fit to order.

Many important modifications have been made in the mechanical details of the Hall torpedo, which have resulted in marked improvements in its performances. This torpedo is still under trial at the Torpedo Station.

The Department has in view the conducting of a series of experiments with dirigible torpedoes looking to their manipulation from a movable base.

Experiments are still in progress looking to the adoption of a suitable torpedo-net defense for our vessels. Three sections of net, two ot which are of American design and manufacture, and the other of a design now in use on vessels of several foreign navies, have undergone tests for brailing up, stowing, and general handling, and will soon be subjected to steaming trials to determine the efficiency of the nets, booms, and fittings, and then to exhaustive progressive firing trials which will be continued until each net is pierced.

ARMOR.

The tests of armor plates at the naval proving ground at Indian Head during the past year have been most important, some exceeding in severity any ever attempted either in this country or abroad. The results of these tests have been conclusive in demonstrating the desirability of using the Harvey process for the armor of all the vessels now under construction. In one test, that of a 14-inch nickel-steel Harvey plate, the results were remarkable. Against this plate were fired four 10-inch Holtzer armor-piercing shells, with striking velocities of 1,472, 1,859, 1,959, and 2,059 foot-seconds, respectively. All four of these projectiles were crushed on the plate, the greatest penetration, which did not exceed 11 inches, being that of the last shot, which was fired at a fragment of the plate weighing but 4.4 tons with a striking energy of 14,715 foot-tons, or 3,344 foot-tons per ton of plate attacked. It is believed that such an energy per ton of plate has never been used in any test.

During the tests for acceptance of armor plates experiments have been made to determine the relative effects of impact of armor-piercing projectiles on ship's framing protected by ordinary nickel-steel plates and by nickel-steel Harveyized plates. In the experiments the backing representing the ship's framing was the same in each case.

The untreated nickel-steel plates receive nearly all the energy within themselves, and distribute it over the vessel in racking effect; while the hard surface of the nickel-steel Harveyized plates causes the energy of impact to be principally absorbed in the disintegration of the projectile. The experiments developed a marked difference in the effects produced, in one case a much heavier nickel untreated plate being set back bodily several inches under impact of 100 foot-seconds less velocity than the lowest striking velocity with which the Harvey plate was attacked, while the latter was scarcely moved at all.

During this year all the armor delivered has been of nickel steel, the tests of which have shown ballistic qualities decidedly superior to what is required for acceptance under the terms of the contracts.

Exhaustive experiments have conclusively demonstrated the beneficial results obtained by the application of the Harvey process, and arrangements have recently been made to Harveyize such of the armor under the old contracts as was not too far advanced in manufacture to admit of the change, or as would not seriously delay the completion of the ships. In consequence of this, much of the side armor of the *Maine*, *Texas*, *Indiana*, *Oregon*, and *Puritan*, the turret armor of the *Maine*, *Puritan*, and *Monadnock*, and the barbettes for the *Oregon* will be of Harveyized nickel steel. All the armor provided for under the new contracts will be treated by the Harvey process.

At the present time this country is no longer alone in the manufacture and use of nickel steel, and nickel-steel Harveyized armor, its initiative having been followed by many foreign powers. Compound armor has been abandoned by the German naval authorities, and that country will hereafter employ nickel steel, and it is believed that Krupp, of Essen, is using a surface-hardening process similar to that of Harvey. Nickel-steel Harvey plates have been very successfully tried in England and Russia, and experiments are going on in France and Italy with a view to having its manufacture domesticated in those countries. The right to use the Harvey process has been secured by an Austrian firm, and the necessary furnaces are now being installed in that country. Nickel-steel armor has been steadily growing in favor in England, and a syndicate, including the principal armor firms of that country, has purchased the right to use the Harvey process.

ARMOR CONTRACTS.

Since the date of the last report it has been found necessary to contract for the remaining armor required for all the vessels now authorized by law. These new contracts include turret armor for the *Indiana*, *Massachusetts*, and *Olympia*, side armor for the *Massachusetts*, and the entire lot of armor for the *Iowa* and *Brooklyn*, amounting in all to 6,480 tons. The facilities for the manufacture and delivery of armor at the Carnegie and Bethlehem Works have been so vastly improved during this year that the difficulty heretofore experienced in the delivery of armor promptly enough to keep pace with the building of ships has been entirely obviated, and the Department has every reason to believe that hereafter these two firms will be able to deliver armor as rapidly as the shipbuilding policy of the Government may demand.

Provisions in new contracts made in March last operate to place the manufacturers under penalties in case of failure to deliver at the rate of 250 tons per month. At the present time it is clear to the Department that this rate will be exceeded. It is due to this rapid increase in the rate of delivery that the large item for armor and armament is presented to Congress in the estimates of this year, as the money will be needed before the end of the next fiscal year to pay for material actually delivered.

SUBMARINE TORPEDO BOAT.

The result of the trial of the Baker submarine boat at Chicago in September, 1892, was carefully considered by the Department with a view to a practical development of the submarine boat for war service. The advantages of a submarine boat seemed to be such that the Department deemed it proper to bring the matter to the attention of Congress, which responded by authorizing the construction of a submarine torpedo boat. The Department issued proposals on May 1 of this year for designs for such a boat, and for proposals for building the same. The bids were opened on June 20, and were as follows:

1. George C. Baker, of Chicago, for $150,000.
2. George C. Baker, of Chicago, for $130,000.
3. John P. Holland Torpedo Boat Company, of New York, for $150,000.
4. Marcus Ruthenberg, of Philadelphia, for $175,000.
5. Cowles Engineering Company, of Brooklyn, for $120,000.

All the designs and proposals were submitted to a board of naval officers for examination and report. While the matter was under consideration the board witnessed a trial of the boat designed by Mr. Baker. Subsequently the board reported that of all the designs submitted the one of the Holland Torpedo Boat Company most nearly met the requirements which the boat is to fulfill, and recommended the acceptance of the proposal of that company.

The Holland design of a submarine boat was favorably considered under a previous advertisement of the Department, that of August 20, 1888, but for want of the necessary funds the Department then found itself unable to accept any bids for such a boat, and therefore rejected all the bids received at that time.

Before deciding whether to accept any of these bids I am having careful investigations made to ascertain what would be the effect upon the crew of a submerged boat of the detonation of a high explosive under water and near by.

VESUVIUS.

As the Department has already recommended that the $450,000 appropriated by the act of March 2, 1889, for the building of a vessel similar to the *Vesuvius* may be made available for the construction of three torpedo boats of about the same size and general design of the *Ericsson*, I deem it best for the information of yourself and of Congress to give a résumé of the circumstances connected with the building and tests of the *Vesuvius*.

The construction of this vessel was authorized under an act of Congress approved August 3, 1886. A favorable report on the system, dated December 1, 1886, having been made by the board known as the "Pneumatic Dynamite Gun Board," a contract, dated February 11, 1887, was made by the Navy Department with the Pneumatic Dynamite Gun Company of New York for the construction of said cruiser, fully equipped and armed with three pneumatic dynamite guns, for the sum of $350,000. The vessel was built by Messrs. Wm. Cramp & Sons, of Philadelphia, and having had a satisfactory steam trial and undergone a satisfactory inspection of the hull and machinery, the Department, on February 5, 1889, appointed a board of naval officers for the purpose of making an examination of the vessel and of witnessing and reporting upon the trial of her armament.

The trial took place on October 9, 1889, three shots being fired for range and fifteen for endurance.

After reporting in detail as to the trial the board concluded as follows:

> No attempt was made to secure accuracy of practice, the trial being to meet the contract requirements as to rapidity of fire and to the capacity of the system to maintain that rapidity for a given time. For this reason it was only sought to lose enough air at each shot to carry a standard projectile well beyond the mile. This was done. But the board being of opinion that some assurance should be had that the loss of air pressure, representing as it does the energy put into the projectile, can be controlled within closer limits, calls the Department's attention to this point, the gun not having been tested in this respect.

After carefully considering the report of this board the Department ordered a second trial, which took place on March 13, 1890, the projectiles used being of subcaliber containing 204-pound charges of gun cotton, and fitted with mechanical fuzes, delayed action being obtained in the first and second shots by time trains intended to burn 5.5 seconds and 1 second, respectively, and the third shot being intended to detonate on impact. The report of this board, dated March 14, 1890, states that the trial showed that a shell containing 200 pounds of gun cotton or other high explosive was thrown at least 1 mile by each of the three dynamite guns constituting the vessel's armament. The vessel was accepted by the Department May 28, 1890.

The information obtained up to the time of acceptance regarding the value of these guns for naval warfare was not sufficient, and in consequence thereof a third trial board was ordered May 13, 1891. As a result of this trial the board recommended that the guns be carefully ranged in some suitable locality, where the fall of the projectiles could be accurately determined from shore stations; that some simple and suitable sight be fitted; that such changes be made in the mechanism for loading and firing the guns as should be found advisable, and that the vessel be then subjected to such further tests as would fully determine her efficiency as a torpedo thrower.

In a later report this same board recommended a detailed programme for further tests and advised certain changes in the system, which recommendations were approved by the Department on June 17, 1891, and the Bureau of Ordnance was directed to make the necessary preparations. These having been completed the Department in January, 1893, appointed a fourth board for the purpose of making a further test of the guns of the vessel.

After maturely considering the report of this board the chief of the Bureau of Ordnance referred it to the Department with the following indorsement:

> Each time the conclusion of the Board has been more or less favorable. Each report, however, has stated that the accuracy of the guns leaves much to be desired. It is manifest that the accuracy of a gun is its most important quality, and without a satisfactory degree of accuracy all other advantages are of minor importance.
>
> The difficulty in the pneumatic guns appears to center in the main valves which admit the air to the gun. At all ranges except the maximum the successful working of the gun demands that this valve should open and close in an exceedingly short time, probably a small fraction of a second. The difficulties encountered in accomplishing this have not been overcome. The Department has already expended $30,000 upon experiments with these guns without any decided improvement.
>
> Without entering further, at this time, into the merits of the system, the Bureau recommends that further experiments be deferred until after the installation at Sandy Hook of the 15-inch guns now in course of construction for the War Department.
>
> In these guns the company promises to overcome the difficulties which exist in those of the *Vesuvius*.

It is just possible that the experiments with the 15-inch pneumatic guns now in course of construction for the War Department may not give such results as to convince this Department of the value of the guns of the *Vesuvius* for naval purposes. The vessel has now been in the possession of the Government for three and one-half years, and in case experiments with pneumatic guns in the near future show these guns to be of little or no value for naval purposes, it would be in the interest of economy to transform her into a vessel available for efficient service with as little delay as possible. With this end in view, I recommend that Congress give the Department conditional authority to transform this vessel into a torpedo cruiser. The displacement of the vessel is such that with her dynamite guns removed a sufficiently powerful battery could be installed to make her a formidable antagonist for unarmored vessels.

STABILITY OF CERTAIN VESSELS.

Before sending the U. S. S. *Detroit* on a foreign cruise, the Department, following the custom of the service, directed that the vessel be inclined at the Norfolk navy-yard to determine its meta centric height. The day after the vessel put to sea, on her way to Rio de Janeiro, the Department received a communication from the superintending constructor at the Norfolk navy-yard forwarding a statement in regard to the inclining experiments on this vessel, and calling the attention of the Bureau of Construction and Repair to the fact that the results of these experiments showed only a narrow margin of initial stability under conditions ordinarily produced in service.

The vessel was then at sea and beyond possibility of immediate recall, and the Department, realizing that this condition of stability presented a question of grave importance for its consideration, referred it to the Board on Construction, with a view to ascertaining what mean should be taken to increase the metacentric height of the *Detroit*, and of her sister ships the *Montgomery* and *Marblehead*, in order to give them a safe margin of stability.

The Board on Construction, after giving the matter its careful and thorough attention, reported its conclusions, and recommended certain changes, the effects of which would be to increase the metacentric height of these vessels about 40 per cent.

Shortly afterwards, on the final trial of the gunboat *Machias*, the fact developed that this vessel also had but a narrow margin of initial stability in conditions ordinarily produced in service, and it was safe to assume that her sister ship, the *Castine*, was in no better condition.

The Department did not believe that this lack of initial stability would render these vessels unseaworthy or dangerous at sea under the ordinary conditions of peace cruising, and this belief became assurance when the commanding officer's report of the cruise of the *Detroit* from Fortress Monroe to St. Thomas came to hand. This report stated that the vessel had encountered a very heavy gale, one of the two that so devastated our Southern coasts during the past season. The vessel behaved well, rolled easily, but, although not taking in any heavy seas, was very wet. Her commanding officer reported that at no time did she have 20 tons of water on her spar deck, which was undoubtedly due to the seamanlike manner in which the ship was handled. The maximum roll officially noted during the gale was 25 degrees to starboard and 20 degrees to port, but her commanding officer, Commander Brownson, believed that she rolled deeper than this at times and showed a certain amount of sluggishness in recovery. However, this sluggishness was to be expected as her meta centric height at the time probably did not exceed 9 inches.

The Department was advised that changes could be made in the Detroit and her sister vessels at no very considerable expense, which would increase the margin of stability to a fair limit of safety for the vessels under war conditions, which differ very materially from those of peace cruising. However, the subject was of too great importance to be treated hastily, and, as the first recommendations for changes necessary to increase this margin of stability emanated from the Board on Construction, which board had previously passed on all changes in these vessels since they were originally designed, I deemed it wise on reflection to refer the question to a second board of experts. This board, which consisted of Commodore John G. Walker, as senior member, and of Capt. E. O. Matthews, Chief Engineer Edward Farmer, Naval Constructor F. L. Fernald, Chief Engineer H. Main, Naval Constructor F. T. Bowles, and Assistant Naval Constructor W. L. Capps, as members, of whom the last-named only was on duty in a Bureau of the Department, assembled at the Navy Department on November 3, and on the day following reported that it had carefully considered all the information submitted by the Department and its Bureaus in regard to the stability of the *Detroit*, and it recommended a number of changes in this vessel and the addition of ballast which would bring her meta-centric height up to 21 inches, and also reported that these recommendations applied with equal force to the *Montgomery* and *Marblehead*. This was substantially the finding of the Board on Construction, and I at once ordered the changes to be made.

This board is now investigating the gun-boats *Machias* and *Castine*, and it is believed, from preliminary reports already in possession of the Department, that the condition of these vessels will require changes to be made in them of a character similar to those recommended in the case of the *Detroit*.

SHIPS IN COMMISSION.

During the past year the available vessels of the Navy have been almost constantly employed, and the necessity for their services in different parts of the globe has been so continuous that the Department has felt constrained to keep vessels in commission which needed extensive repairs and should have been laid up for that purpose.

The need of ships constantly in Asiatic waters is universally recognized. That they are absolutely essential also in Central and South American waters has been emphasized during the present administration by revolutionary troubles, all imperiling more or less the rights of American commerce in Peru, Nicaragua on the east and west coasts, Honduras, Guatamala, Costa Rica, Argentina, and Brazil. In order to even imperfectly patrol the Bering Sea during the past season it was necessary to call in the aid of a vessel of the Fish Commission—the *Albatross*—and of three vessels of the Revenue Marine.

At the date of the last report Admiral Bancroft Gherardi, in command of a squadron composed of the *Baltimore*, *San Francisco*, *Charleston*, and *Yorktown*, was on his way from the Pacific to Hampton Roads to take part in the naval review. Upon his arrival he was placed in command of the naval review fleet.

The North Atlantic squadron, under the command of Rear-Admiral John G. Walker, and the squadron under Rear-Admiral A. E. K. Benham, during the period of the naval review became parts of the naval review fleet. When the naval review fleet was disbanded, May 31, 1893, Rear-Admiral A. E. K. Benham was appointed commander in chief of the North Atlantic squadron, with the following vessels under his command: *San Francisco*, *Miantonomoh*, *Atlanta*, *Kearsarge*, and *Vesuvius*. The *Atlanta* has since been placed out of commission, and is now undergoing repairs. She had been continuously in commission for six years.

The *Newark*, flagship of Rear Admiral A. E. K. Benham, accompanied by the *Bennington*, returned to the United States from Europe in time to take part in the review, convoying the two caravels, *Nina* and *Pinta*, to Havana en route. The *Essex* has returned to the United States and has since been overhauled and repaired for service as a training vessel. When the naval review fleet was disbanded the *Chicago* and *Bennington* were ordered to the European station under the command of Acting Rear-Admiral Henry Erben.

The details of the naval review fleet will be treated separately in the latter part of this report.

The *Yantic* was the only vessel on the South Atlantic station for many months. The *Newark*, *Charleston*, and *Detroit*, are now in Brazilian waters. The *Charleston* will remain there till her services are no longer needed, and will then proceed to the Pacific station.

The vessels on the Pacific station at the present time are the *Philadelphia* (flag-ship), *Yorktown*, *Mohican*, *Adams*, *Alliance*, *Monterey*, and *Ranger*. The *Boston* was on service in Hawaiian waters from August, 1892, until September of this year, when she was placed out of commission at the Mare Island navy-yard in order to receive necessary repairs. The operations of the vessels composing the Bering Sea fleet are referred to elsewhere.

The vessels on the Asiatic station are the *Lancaster* (flagship), the *Marion*, *Concord*, *Monocacy*, and *Petrel*. The *Baltimore* is now on her way to that station, where she will relieve the *Lancaster* as flagship, after which the latter-named vessel will proceed to the United States. Affairs on this station have been of such a nature during the past year as to keep the vessels there moving almost continuously.

The *Thetis* is engaged in surveying work on tl [illegible] c[illegible] [illegible] t America. The *Pinta* has continued on [illegible] waters, and the *Michigan* on the Lakes. The training squadron has made the usual practice cruises during the year.

It is the present intention of the Department to bring up the force on each station to the number which experience has proved to be necessary for the proper, efficient, and economical protection of American interests, by the addition of new vessels as they become available.

NAVAL CONSTRUCTION ABROAD.

The policy of naval construction now adopted by the principal foreign naval powers looks to the building of battle ships, armored coast-defense vessels, armored cruisers, torpedo vessels, and torpedo boats.

The average displacement of the largest battle ships authorized or now in process of construction in England, France, Russia, and Italy, is a little over 13,000 tons. The largest of these, an English battle ship, is to be of 14,900 tons. This vessel will probably mark the limit to the increase in size of battle ships which has been steadily going on for the last ten years, the object of the increase having been to produce in one vessel all the elements of perfection of a fighting machine necessary to obtain the maximum of offensive and defensive power in combination with high speed and a large radius of action.

The only foreign nations building coast-defense vessels are France and Russia. The largest they are building of this class are to be of 6,600 tons.

The latest designs of armored cruisers show a great increase in size, those recently authorized in England being designed for a displacement of 14,000 tons, and a sustained sea-speed of 20 knots. The largest armored vessels of England, France, and Russia are to average about 11,000 tons displacement, and are to have a maximum speed of not less than 20 knots.

The torpedo vessel, or torpedo cruiser, is common to all the principal foreign powers, but is not as yet found in our Navy. That great importance is attached to this type of vessel abroad is evidenced by the fact that England is at present building a number aggregating 7,780 tons; France, 2,894 tons; and Italy, 4,230 tons. The value of this type of vessel can not be overestimated. It combines in a great measure the offensive qualities of the torpedo boat with the cruising and coast guarding qualities of the gunboat, having an advantage over the former in size and speed, and over the latter in the ability to cover a greater length of coast line in a shorter space of time. The average displacement of those now building is about 830 tons. They range in speed from 19 to 22 knots, and carry an armament of rapid-fire guns and torpedoes.

Improvements in torpedo boats building abroad are in the direction of increased size and speed. One hundred and ninety-seven of these vessels are now either authorized or under construction by other naval powers.

NAVAL POLICY.

In your first message to Congress, December, 1885, you said:

> All must admit the importance of an effective navy to a nation like ours, having such an extended seacoast to protect. And yet, we have not a single vessel of war that could keep the seas against a first-class vessel of any important power. Such a condition ought not longer to continue. The nation that can not resist aggression is constantly exposed to it. Its foreign policy is of necessity weak, and its negotiations are conducted with disadvantage, because it is not in condition to enforce the terms dictated by its sense of right and justice.

We have not even yet in commission a "single vessel of war that could keep the seas against a first-class vessel of any foreign power," although we have four such in process of construction. When your message was written the United States had building three modern unarmored cruisers, the *Chicago*, *Boston*, and *Atlanta*, and one dispatch boat, the *Dolphin*. But there was no establishment in the United States that could turn out armor for modern vessels, and not one that could furnish the forgings for a modern gun larger than 6 inches caliber. No automobile torpedoes had ever been manufactured in this country; no modern rapid-fire guns, and not a grain of powder for a high-power gun. Your distinguished Secretary of the Navy, Mr. Whitney, following out the suggestions of your message, applied himself at once to the task of laying broad and deep the foundations upon which the construction of a modern navy has progressed steadily and methodically up to this day. It was not his purpose, nor has it at any time been the intention of Congress, to build a navy equal to those of such great naval powers as France and England, but it is certainly sound policy to maintain a navy at least as efficient, when compared with others, as that which our country was in possession of in the days before the era of modern navies, and when our seaports were deemed to be, as they certainly are not now, amply provided with fortifications fully up to the requirements of the age. Our Navy has not yet come up to that standard.

Secretary Whitney was thoroughly aware of the magnitude of the task before him. Every step in the undertaking was carefully considered. Not only were we to have ships and guns, but they were to be equal, if not superior, to the best in the world. Anything short of this would violate the traditional policy of our Government and be unworthy of the American people. The ships built, the armor and gun forgings turned out under the contracts made by Mr. Whitney, the great guns assembled at the magnificent plant he established, and the rapid-fire guns made by the industry he domesticated in this country, all testify to his wisdom and foresight. The great work thus un fort
nately fell afterwards into competent hands,
ried it forward with distinguished ability.

The programme which has been s
been to authorize one or more vessels

first our shipbuilders were without experience, and, as different types of vessels are needed in every navy, authorizations gradually proceeded, as common prudence dictated, from smaller to larger vessels. The second-class battle ships *Maine* and the *Texas* were the largest vessels laid down by Secretary Whitney. They are efficient armored vessels, filling a much-needed place in our Navy, but they were never intended to be battle ships of the first class. We have now building only four vessels which can properly be denominated first-class battle ships. The cruisers and gunboats we have, built and building, constitute an efficient fleet, and will prove sufficient, when they shall all be in commission, for cruising purposes in ordinary times, and to look after our commerce abroad. In time of war these cruisers, aided by the *Paris*, the *New York*, and the other ships being built by Wm. Cramp & Sons for the American line, which constitute practically all of our auxiliary navy that is valuable, would be of great use as commerce destroyers.

But unarmored cruisers are not, properly speaking, fighting vessels. They can destroy merchant ships, they can fight vessels of their own class, but they can not meet armored vessels with any reasonable hope of success, and in time of war, scattered abroad over the high seas as they would be if we sent them against an enemy's commerce, they would leave our unfortified seacoast, with all its cities, absolutely without reliance, except upon our four first-class and two second-class battle ships, seven coast-defense vessels, and two little torpedo boats. These, if they were all concentrated, would scarcely be able to create a diversion of an enemy's fleet, and if scattered would not furnish a battle ship or even a torpedo boat for the defense of each coast city. If we carried out such a programme during a war an enemy with a fleet of battle ships could wreck cities while we were robbing schooners.

The military value of a commerce-destroying fleet is easily overrated. Cruisers directed against an enemy's wealth afloat are capable of doing great damage. They create consternation among merchants and worry the people against whose property they are directed, but unsupported by ships of the line their operations are perhaps never decisive of a war. During the twenty years from 1792 to 1812, the period covered by the French Revolution, French cruisers and privateers captured many thousands of British vessels and cargoes, but these captures operated more to provoke a spirit of determined hostility among the British people than to create such distress or alarm as would put an end to hostilities. English line-of-battle ships, instead of scattering to convoy merchant vessels, hunted and destroyed the French vessels of war at the battle of the Nile, at Cape St. Vincent, and at Trafalgar. In the meantime, in
i te of her losses of merchant ships and their cargoes, England con-
tin d to grow rich by her commerce. With her mighty battle ships
cut off Napoleon's communications by water. With her wealth she
1 his enemies, and it is undoubtedly true that the two great
the downfall of the great conqueror were the numerous battle

ships of England, with their hardy crews of Anglo-Saxons, and the enormous wealth of the greatest sea power of the world.

The history of our civil war furnishes a more recent and familiar proof of my statement. The cruises of the *Alabama* and her sister ships were uncommonly successful. Semmes rivalled the exploits of Jean Bart and Du Guay-Trouin. History will rank him as one of the most famous rovers of the seas. His success delighted the Confederates, but it did not benefit their cause. Many, indeed, were the complaints made against President Lincoln because he sent so few ships to search for the Confederate cruisers, but he was too wise to listen to the clamor. The fleets of the United States were not to be thus diverted from their purpose. They blockaded the ports of the Confederacy, they penetrated its rivers, cut off its interior communications, and thus it was that the Navy rendered services to the cause of the Union which the public has never yet fully appreciated. In the meantime, in spite of depredations, American commerce flourished. Merchants insured against war risks, and individual losses were borne by communities. Commerce destroying was irritating, but it decided nothing. It would have been ineffectual even if the Confederates had possessed ten times as many cruisers, unsupported as they were by line-of-battle ships.

If our Government in the future is to have naval strength enough to command the peace and be in condition to "enforce the terms dictated by its sense of right and justice" it must have more battle ships, and must build a reasonable number of torpedo boats.

For the defense of ports, torpedo boats are perhaps more effective according to cost than any other class of vessels. The knowledge of their existence alone will make an enemy chary about approaching within bombarding distance. The value of this boat is recognized by all naval powers, and they are being built abroad in great numbers. Their usefulness was emphasized last summer during the English naval manœuvers under war conditions where service torpedoes with collapsible heads were used. In these manœuvers one of the contending squadrons was without these boats, but was furnished with battle ships and a number of fast cruisers and gun vessels; the other had twenty-four torpedo boats stationed at six of the ports to be defended.

During the progress of the manœuvers (seven days) frequent attacks were made by these boats in groups, and the official decisions of the umpires recognized that they had destroyed one battle ship and six cruisers. The vessels decided to have been destroyed were actually struck by torpedoes with dummy heads and no other claims were allowed. During this period, eighteen torpedo boats were deemed to have been destroyed by the enemy. A rough calculation of the difference in expenditure will give the value of the battle ship, which carried 400 men, as $3,750,000, and of the six cruisers, which carried 1,650 men, as $6,000,000, an agregate of 2,050 men and a total value of $9,750,000, while the value of eighteen torpedo boats was about

$1,800,000, and their crews aggregated 350 men, the difference in losses being, in money, $7,950,000, and in men, 1,690. Torpedo boats, however, can not be relied upon alone. They must be accompanied by battle ships, as the enemy will be certain to come with battle ships and torpedo boats also.

No one can value economy more highly than I do, and its practice is certainly necessary at this time when the Government expenditures are likely to be more than its receipts, but the safety of the country, its honor, and its dignity must rise above every other consideration, and it is respectfully submitted that the programme of authorizing the building of at least some vessels at each session of Congress ought not to be interrupted now. I recommend that the construction of at least one battle ship and six torpedo boats be authorized by Congress at the coming session.

The authorization of these vessels would require the expenditure of very little money during the coming fiscal year. First-class torpedo boats can now be built for $120,000 each, and not more than $360,000 of their cost, estimating the total at $720,000, would be expended within the fiscal year ending June 30, 1895. So much time is required to perfect the plans of a battle ship, put it under contract, and provide the material, that not more than one-tenth of the cost of such a vessel, if it should be authorized, would need to be appropriated during the coming session of Congress. Every vessel now authorized may be expected to be in commission by the first day of July, 1896, so that unless other ships be provided for now we shall at that date not have a single ship in process of construction. The question is therefore presented whether on account of the present condition of the Treasury the programme of building a moderate sized navy shall be absolutely arrested. It is not believed that the American people, intent as they are on enforcing economy in Government expenditures, are willing that this great work should be stopped short at this time. It may be well, considering financial conditions, to make only a moderate provision for new ships, but it would be much regretted if Congress should, by making none whatever, indicate an intention to abandon entirely the work of constructing the new Navy at a time when all the plants are in operation throughout the country, ready to build in better style and at more economical rates than ever before.

That Government expenditures have exceeded all reasonable bounds can not be charged to the new Navy. Discussing this question in a report which I had the honor to make to the House of Representatives on the 13th February, 1893, and referring to what is sometimes called the golden era of economy, I said:

> In 1860 the total expenditures for all purposes by the United States Government,
> luding pensions and interest, were $81,353,155.78. The average annual expendi-
> for the Navy for the years 1858, 1859, and 1860 were $12,939,126, equivalent to
> cent of the total. Excluding pensions and interest upon the public debt, the
> es of the Navy for the past eight years, while we have been reconstructing it
> dern basis, will not amount to more than 5 per cent of the total. Cer-

tainly this would seem to indicate that whatever extravagance may exist it is not chargeable to the Navy.

Another view of the comparative cost of our Navy in the days preceding the civil war and now may be gathered from the following:

The annual average appropriations for the Navy of the United States for the five years preceding and including 1860 were $12,873,804.98. The census of 1860 gave the population as 31,440,000, which would give an expenditure of over 40 cents per capita. This was the era of wooden ships, cast-metal guns, and cast-iron projectiles.

The average annual appropriations during the ten years within which we have been building a modern navy of steel ships, armed with wrought-steel guns, has been $21,408,653.96. Counting our present population at 67,000,000, gives an average of less than 32 cents per capita.

A more correct idea of the propriety of the present expenditures for the Navy may be gained, however, by reminding the House that the annual average expenditures for the Army are greater than those for the Navy.

The Indian troubles are almost over, and volunteer armies could be raised, as our civil war demonstrated, that would defend us against any enemy whatever; but all the inhabitants of the United States, assembled at any point of our seacoast where there were no fortifications, would be unable without ships to defend it against an attack from the sea.

The increase of our population, and the expansion of our trade under more favorable commercial regulations than at present, which may be expected to result from future legislation, are certain to beget American interests which will look to naval protection in all parts of the world. The regulation of the seal fisheries and the frictions which, even under the best regulations, are likely to exist in the neighborhood of Bering Sea; the great naval establishment maintained by Great Britain at the entrance of Puget Sound; our close interests with China and Japan, increased every day by powerful lines of fast steamships; our geographical and political relations with the islands of the Pacific; our multifarious interests along the whole South and Central American coasts, now more or less in a state of political unrest, would be sufficient to tax nearly all of our present naval strength in the Pacific Ocean alone. Indeed, the continent to the south of us, and both oceans, as I have said before, now demand the presence of American ships of war to a greater extent than ever before, and this demand is not, in my judgment, a temporary one, but one that will steadily increase.

We cannot but have most intimate relations, in every phase of national existence, with the great governments of the Old World, whose subjects are now in phenomenal numbers becoming citizens of our country. As we receive these we assume the responsibility of protecting them, in many cases against their former governments. With the growth of our population and our wonderful development, it is beyond doubt that the energies of our people will be more and more directed to foreign trade and to the extension of our interests in all directions, while the increasing immigration of subjects of foreign powers in both Europe and the Orient is all the time complicating our relations towards other governments. It seems certain, therefore, that the future is to bring with it an increase of international questions, to a settlement of which, in a manner which will be at once peaceful and honorable, naval strength will be absolutely essential. We must make and keep our Navy in such a condition of efficiency as to give weight and power to whatever policy it may be thought wise on the part of our Government to assume. The Navy is to maintain an honorable peace, begotten by an assured strength to protect rights, enforce just claims, beget security against foreign aggression, and compel respect for any policy of our people which may affect foreign nations.

With the increase of ships herein outlined, our Navy will still be one for defense rather than offense. We would, however, with this policy enforced, have our ports adequately protected and at the same time have sufficient power on the high seas and in foreign ports to maintain the rights and interests of our people, and to uphold the honor and dignity of our flag among the nations of the earth, without unduly burdening our people or entering into any rivalry with those great navies maintained by nations who believe their existence depends on their naval strength.

I feel sure that this policy will have the full and hearty approval of the large majority of our people.

PERSONNEL.

I cannot too strongly recommend Congressional action in reference to the personnel of the line of the Navy. Its present condition is too serious to be neglected any longer, and unless remedies are adopted looking to some system of promotion which will produce a regular flow from the bottom to the top of the list, the consequences, not only to the service but also to the Government, will soon be nothing less than alarming.

The object of any scheme of promotion in the Navy should be to produce efficient commanding officers, the accomplishment of which necessitates that officers of the line be made to bear the responsibilities of actual command by or before the time they have reached the prime of life; while they are still young enough to accommodate themselves to the demands upon intellect and energy which are made by the assumption of control of a modern man-of-war.

A clear understanding of the necessity for immediate action in this matter can only be gained by a statement of the principal causes heretofore existing which have led to the present stagnation in promotion, which statement will also show that neither the evils themselves nor the necessity for removing them are open to dispute. The principal causes which have led to the present condition of affairs are, briefly stated, as follows:

First, in 1855 Congress authorized a scrutiny of the active list which resulted in the removal of a large number of officers, the vacancies thus created being filled from the passed-midshipmen of the Navy. The immediate effect of this was the reduction of the number of officers below the grade of lieutenant from 258 in 1854 to 78 in 1857. This number had only increased to 91 when the outbreak of the civil war occurred, an event which caused a great number of resignations from all grades of the Navy, creating at once many vacancies all through the line, to fill which there existed only the small number of junior officers mentioned above. The resulting embarrassment of the Department for officers in the junior grades forced the Government to supply its wants from the merchant service.

To this lack of officers in a time of sudden need was due the unfortunate policy which prevailed from 1860 to 1867, inclusive, and which has contributed, more than any other cause, to the present stagnation in promotion. During most of this period the numbers in the classes under instruction at the Naval Academy were kept at the highest possible limit, the cadets being pressed to graduation in large numbers and with the utmost rapidity. On the 1st of January, 1865, there were 486 midshipmen in the service, all of whom had entered since the war began. In January, 1866, there were in the Academy 147 midshipmen in the fourth or lowest class alone. Midshipmen were graduated during the years 1866–'67–'68 at an average rate of about 78 per year. In 1862 the demands of the war, and in 1866 a necessary reorganization, had each contributed to so increase the numbers as to make promotions to the grade of lieutenant very rapid, but only for a few years to follow. The senior 16 midshipmen of the 78 who were graduated in 1868 became lieutenants in 1872, at an average age of 24. The 12 seniors of this class have been promoted to lieutenant-commanders since the beginning of this year at an average age of 45, and after having served twenty-one years in the grade of lieutenant.

At the same time that this disproportionate number of graduates entered the active service the number dating from 1860 and 1861 was further increased by the admission of many officers from the volunteer Navy, whose ability and services had entitled them to such recognition on the part of the Government.

Second. The effect of an act passed in 1870 which largely increased the numbers in the lower grades of the Line.

Third. The effect of an act passed in August, 1882, which largely decreased the numbers in the higher grades of the Line.

The present result of the combined causes mentioned above is shown in the following table, which gives the average ages at which officers of the line now reach the several grades:

Grade.	Age.
Rear-Admiral	61
Commodore	59
Captain	50
Commander	48
Lieutenant-commander	46
Lieutenant	36
Junior lieutenant	33

I have endeavored to impress you with my deliberate conviction that this most important branch of the public service, which may properly be termed the right arm of the Republic for external defense, now suffers from two great evils, viz:

First, a large proportion of the officers of the line of the Navy, at a time when mind and body ought to be at the best, are serving in the lower ranks without command and the habit it begets.

Second, no method now exists whereby the Government can get the very flower of its personnel into those positions where they can be of the greatest service to the country, in consequence of which a dull mechanical movement takes the place of healthy progression led by merit and fitness.

I am engaged in the preparation of a plan for the reorganization of the line of the Navy which I think will meet the requirements of the service, and I shall have the honor to present it to the Committees on Naval Affairs, and also to the Joint Committee to investigate and consider the subject of the rank, pay and other matters relating to the personnel of the Navy proposed in the concurrent resolution introduced by the Hon. Mr. Meyer, in case said concurrent resolution becomes a law.

Before concluding these remarks on the personnel, it gives me pleasure to express the high opinion I have formed of the ability and efficiency of all the corps of the Navy.

During the short time that I have occupied this office, the whole strength of the service has been most actively engaged, both at home and abroad, on various duties calling for dispatch, fidelity, and judgment. I am glad to say that, taken as a whole, I can not do otherwise than commend the promptness and ability with which these duties have been performed. I think it is no exaggeration to say that, with the reform herein shown to be necessary, the Navy of the United States will have no superior in its personnel, and that its professional proficiency and ability to build, arm, equip, provision, and handle modern ships of war will increase with every year and will keep its officers in the vanguard of military and naval progress.

ENLISTED MEN.

The present condition of affairs abroad makes it imperatively necessary that the new vessels should be sent to duty on foreign stations as rapidly as they become available, but the Department finding that the present number of enlisted men and boys in the service is insufficient for this purpose, I have the honor to recommend that this force be increased by 2,000 men.

In order to enable the enlisted men of the Navy to become citizens of the United States, as is most desirable, without forfeiting their continuous service in the Navy, it is recommended that the privilege granted to enlisted men of the Army by section 2166 of the Revised Statutes be also granted to the enlisted men of the Navy.

OPERATIONS IN BERING SEA.

On the 21st of April, 1893, the Department designated Commander Niçoll Ludlow, U. S. Navy, to take command of a squadron of vessels to cruise in and about Bering Sea, for the purpose of carrying out the provisions of the convention between the United States and Great Britain, dated April 18, 1892, for a *modus vivendi* in reference to the taking of seals. The squadron consisted of the *Mohican* and *Ranger*, temporarily transferred from the Pacific Station; the *Petrel*, temporarily transferred from the Asiatic Station; the Fish Commission steamer *Albatross*, temporarily transferred from the U. S. Fish Commission by order of the President; and the revenue cutters *Rush*, *Corwin*, and *Bear*, which, by direction of the Secretary of the Treasury, were placed under the orders of the naval officer in general command.

The squadron assembled at Port Townsend, from which place the *Bear* and *Rush* sailed on the 26th of May, the *Corwin* the 27th, the *Albatross* the 28th, the *Ranger* the 29th, and the *Mohican* the 31st, for a cruise in the waters in and about Bering Sea. The orders to the commanding officers of these vessels directed them to warn all American and British vessels found outside of Bering Sea not to enter its prohibited waters for the purpose of sealing, and to seize all vessels found to be or to have been employed in sealing within said waters, whether with or without warning, and all vessels found therein, whether warned or not, having on board implements for taking seals, sealskins, or bodies of seals.

The commanding officers of all vessels were directed to take careful soundings and to gather such hydrographic information as might be of use for correcting the imperfect charts of Bering Sea. They were further directed to collect as much information as it was practicable for them to obtain upon the habits and customs of the seals without killing them.

The provisions in the Revised Statutes as to seizures were closely followed.

By June 13 the *Mohican* had boarded and warned six American vessels, and one British, and the *Rush* twelve American and six British. By June 24 the *Albatross* had boarded and warned seven American and fourteen British. By June 25 the *Ranger* had boarded and warned nine American vessels and five British. H. B. M.'s ships *Garnet* and *Nymphe*, coöperating with the United States force in carrying out the provisions of the *modus vivendi*, reported on June 25, having boarded and warned seven American vessels and ten British. The American schooners *St. Paul* and *Alexander* were seized on the 2d of July for violation of section 1965 of the Revised Statutes.

On the 6th of July a large quantity of liquor was seized from the bark *Horatio*, which was on board in violation of section 1955 of the Revised Statutes.

On the 7th of July the American schooner *C. G. White* was seized for violation of section 2867 of the Revised Statutes of the United States, the entry in her logbook showing that she had transferred 215 seal skins to the schooner *Czarina.*

By July 8 all American sealers known to be in the Pacific had been boarded and warned. Of the other sealers all had been boarded and warned, with the possible exception of three British schooners, which it was thought had returned to Victoria.

On the 28th of August the *Rush* was detached from the squadron at Unalaska and ordered to proceed to San Francisco. On September 22 the *Petrel* was ordered to Sitka, and to proceed thence to the Asiatic station. On the same date the *Corwin* was detached from the squadron at Unalaska and ordered to proceed to San Francisco. The *Mohican* sailed from Unalaska for Sitka on the 23d of September, the sealing season being over.

The *Albatross* returned to San Francisco on September 30, and the *Ranger* October 3. The latter vessel took eleven destitute citizens from Unalaska to San Francisco.

The squadron was judiciously distributed by its commanding officer in Bering Sea, and it continued active cruising within the prohibited waters during the entire season.

The Department takes pleasure in recognizing the valuable services rendered by the revenue cutters.

The operations of this squadron, under the command of Commander Nicoll Ludlow, reflect great credit upon that officer.

NAVAL MILITIA.

It is gratifying to the Department to be able to state that public interest in the naval militia is gradually and steadily increasing. At the date of the last annual report the number of men certified as mustered in and serving in the naval militia of seven states was 1,794. During the present year organizations have been authorized by the legislatures of Pennsylvania and Illinois, and the number of officers and men mustered in and serving at the present time is as follows:

Massachusetts	589
Rhode Island	119
New York	410
Pennsylvania	150
Maryland	130
North Carolina	262
South Carolina	204
California	301
Illinois	211
Total	2,376

The legislatures of two other states, Michigan and Connecticut, have also passed laws authorizing the formation of naval militia battalions, but as yet no officers or men have been mustered in thereunder. The organization of the naval militia was an experiment of which many doubted the success. But the high character of the young men who have enlisted in the movement and the zeal and patriotic ardor with which they have so far performed the duties upon which they have entered are certainly enough to inspire the hope that the naval militia will prove to be of value to the country.

Early in this administration the Assistant Secretary, who has this matter in charge, and whose invaluable assistance, not only in the many matters entrusted especially to him but also as a counselor in others, I am pleased to acknowledge, decided upon a definite policy in regard to the practical instruction of the naval militia, in pursuance of which letters were written to the governors of the various states in which there existed legally organized naval militia forces, offering on the part of the Department to afford each of these organizations an opportunity to make a cruise of from four to seven days on board a war vessel for the purpose of drill and target practice. In accordance with this intention the Department directed Rear-Admiral A. E. K. Benham, U. S. Navy, commanding the United States naval forces on the North Atlantic station, to authorize drills and instruction on vessels of his command.

In the Department's instructions to Admiral Benham were included the following extracts:

> During the four days * * * you will get the ships under way and proceed to sea at such times and for such periods of time as may seem best to you to carry out the object of this cruise—the instruction of the naval militia.
>
> The Department desires that all the time possible be devoted to drills and instruction underway, in addition to such target practice as you may think necessary, and directs that there be no landing or harbor drills of any kind except such as may be classed under the customary and ordinary use of the ship's boats.
>
> The Department requests, from such officers as you may detail to make them, reports on the efficiency of the militia, both officers and men, the reports, generally speaking, to cover the subjects of their professional knowledge, organization, discipline, drill, uniform, efficiency as seamen, firemen, or ship's artificers, the completeness of their organization as a ship's company, and the readiness and availability of the force as a whole to completely man a ship of war should it be called upon to do so.
>
> The men are to perform all the duties of their rates as far as practicable, and, whenever possible, are to be drilled by their own officers, though always under the supervision of the regular officers of the ships.

There was a general disposition on the part of our volunteer sailors to accept this offer of the Department, and drills and instruction were had on board naval vessels as follows:

Two hundred and forty-one officers and men of the Massachusetts naval militia were embarked on the *San Francisco* and *Miantonomoh*. They took the places and performed the duties of an equal number of the regular crews, which were temporarily transferred to the receiving ship at Boston, Mass.

Sixty officers and men of the Bristol division of the Rhode Island naval militia embarked on board the *Miantonomoh* for four days' drill, the men going on board in the morning and disembarking in the evening, all the drills and instruction taking place with the vessel under way.

The two separate Rochester divisions of the New York Naval Militia, numbering 70 officers and men, received four days' instruction at sea on the flagship *San Francisco.* The first battalion of the New York Naval Militia decided not to embark on a man-of-war on account of the battalion's lack of sufficient preparation and organization. This battalion, however, spent a week on board the old line-of-battleship *New Hampshire*, at anchor in Cold Spring Harbor, Long Island, for the purpose of drill and instruction.

A part of the Philadelphia divisions of the Pennsylvania Naval Militia, numbering 93 officers and men, embarked on the flagship *San Francisco* with the two divisions of Rochester, N. Y., and were instructed and drilled for four days at sea.

Sixty-eight officers and men of the North Carolina Militia received four days' instruction on board the *Kearsarge*, the drills and target practice taking place at sea. After this tour of duty the monitor *Nantucket* was turned over to the governor of North Carolina for the use of the naval militia of that State.

The naval militia of South Carolina had intended to take a four days' course of instruction on the *Kearsarge*, but were prevented from so doing by reason of the unfortunate experiences of many of its members during a disastrous storm just prior to that time.

It was the intention of the Department to give the militia of California an opportunity of gaining experience at sea, but no man-of-war was available on the Pacific Coast for that purpose.

From the reports received by the Department during the year, it is apparent that the naval militia organizations under the different states are progressing as rapidly as possible under the peculiar circumstances of their situation on shore.

The interest of the Navy Department in the naval militia must, in the very nature of things, depend upon its efficiency as a seagoing force; and it is the intention of the Department to give the various organizations its most hearty coöperation in all efforts tending to such an end.

The experience of this year has so impressed the Department with the importance of the annual cruise that its policy in this direction will, if circumstances permit, be carried out on even a larger scale during the next year.

It is exceedingly gratifying to see so many of our patriotic citizens thus voluntarily organizing and laboring to fit themselves for naval duty. Our long and exposed seacoast and the difficulties attending enlistment of sailors from our merchant marine make this organization of great national importance, and the Department will do everything possible under existing laws to foster and encourage it.

THE COLUMBIAN CARAVELS.

These vessels, the *Santa Maria*, *Nina*, and *Pinta*, were constructed in Spain, the first named at the expense of the Spanish Government, and the other two at the expense of the United States under authority granted in the naval appropriation act dated July 19, 1892. All were completed in time to participate in the Columbus celebration at Palos, Spain, in October, 1892. Afterwards the *Santa Maria* was brought to the United States via Havana, under Spanish naval officers and men. The *Nina* and *Pinta* were convoyed and towed to Havana by the United States ships *Newark* and *Bennington*. At Havana they were turned over to the Spanish authorities, by whom they were brought to the United States, and with the *Santa Maria* participated in the naval review in April of this year. Under direction of the Department they were all afterwards towed to the World's Columbian Exposition at Chicago.

The *Santa Maria* having been presented to the United States by the Spanish Government, was turned over to the Secretary of the Navy with appropriate ceremonies at the World's Fair. In September of this year, the Spanish officers and seamen of these vessels were relieved by officers and seamen of our Navy. At the close of the Fair, the Columbian Museum Company of Chicago, intending to apply to Congress for the passage of an act donating the caravels permanently to the city of Chicago, offered to take charge of them pending the application. The Department having satisfied itself that the vessels would be properly cared for, accepted the offer and turned them over accordingly, thus saving itself the burden and expense of their preservation during the coming winter.

The caravels are of no use to the Navy but remain as most interesting historical mementoes, not only of the courage and genius of the illustrious discoverer of our continent, but also of the great World's Fair Exposition, and of the friendly action of Spain in building and sending to this country the *Santa Maria*. It is, therefore, suggested that Congress be asked to direct what disposition shall be made of them. Should Congress decide that they are to be brought to Washington, I recommend that an act be passed authorizing the expense of towing and bringing them to be paid from the unexpended balance of the appropriations for the "International Naval Rendezvous and Review."

In this connection I beg to inform you that Capt. Andersen, the daring navigator who brought the *Viking* to the Exposition, and who represents those enterprising citizens of Norway who built the boat, has signified his intention to present that vessel to our Government through the Navy Department, and I have intimated an intention to accept it. I therefore recommend that Congress shall also provide that some suitable disposition shall be made of the *Viking* when it shall come into the hands of the Government.

INTERNATIONAL NAVAL RENDEZVOUS AND REVIEW.

Referring to the International Naval Rendezvous and Review, authorized by act of Congress approved April 25, 1890, it gives me pleasure to state that all the details connected with the organizing and conducting of this undertaking were carried out in the most satisfactory manner. The rendezvous took place in Hampton Roads April 24, the foreign ships commencing to arrive by April 8. Rear-Admiral Bancroft Gherardi, the senior officer of our Navy, was given entire charge of the conduct of all operations connected with this event. With a fleet of twelve American vessels he received the visiting ships as they arrived at Hampton Roads, paying to the officers and crews of the foreign vessels those courtesies which are naturally incident to an occasion of this character. On the 24th of April the vessels of the combined fleet, which consisted of twelve from the United States, four from England, three from France, three from Brazil, two from Russia, two from Italy, two from Germany, and one from Holland, got under way and proceeded to New York in fleet formation, with Rear-Admiral Gherardi in command. At New York this fleet was joined by one more Russian vessel, three Spanish vessels, one Argentine vessel, and the *Miantonomoh*, of our own Navy, making a combined fleet of thirty-five men of war.

On the 26th of April this large fleet, in double-column formation, proceeded up New York Bay and the Hudson River to the naval review anchorage, where the three caravels were found awaiting it. On the 27th of April the fleet was reviewed by the President on board the *Dolphin*, each vessel as it passed rendering him the honors due his position. On the following day, the 28th of April, armed battalions of the United States, England, Russia, Germany, France, Italy, Brazil, Argentina, and the Netherlands, amounting in the aggregate to 3,815 men, marched in column of brigades through the principal streets of New York and were reviewed by the governor of the State. This parade closed the review. The entire affair was a success in every respect, this being due not only to the skillful and delicate conduct of the American admiral in command of the combined fleet, but also to the cordial and hearty coöperation afforded him by the officers commanding the foreign squadrons. The review was not only instructive to all our people, but was of the greatest interest to the naval service.

The appropriations for the naval rendezvous and review, including all costs and expenses of the caravels, aggregated $350,000. The greatest single item of expense in connection with the review was work done on naval vessels, much of which was otherwise necessary, amounting to $39,060.50.

Of the $350,000 appropriated the Department turned back into the Treasury of the United States June 30, 1893, $250,000, and still has to its credit, in excess of all known and estimated liabilities, a balance of $16,553.12.

SUPPLIES, PURCHASES, AND ACCOUNTS.

The system of accounts, purchases, and supplies initiated by Ex-Secretary Whitney, and so carefully developed in the Bureau of Supplies and Accounts during the administration of my predecessor, has so operated during the present administration of the Department as to commend itself to my judgment. The concentration in one bureau of the accounts pertaining to the establishment, and the consolidation under the direction of the same bureau of all supplies belonging to the Navy, has proved business-like, economical, and to the best interests of the Government. The point to which the system has now been brought enables the Department to obtain at any moment precise and accurate information of the cost to a given date of any ship in process of construction by the Government, the quantities of the various articles on hand in general stock at any navy-yard, and the exact condition of all appropriations made for the naval service.

The advance made within the past three or four years under this system in the direction of improved methods in the transaction of public business and for a stricter accountability for Government property is very great, and the attention of the Department will be directed to the further development of the system now in operation with a view to securing, through an enlarged application of it, results more valuable than any that have yet been reached in the matter of accounts, and still greater economy in the purchase and handling of supplies.

The supply fund established by the last Congress for the maintenance of a stock of such ordinary commercial articles as are in frequent demand is in operation at three of the principal yards. The benefits resulting from the fund are already apparent in a reduction in the number of open-purchase requisitions, a speedier furnishing of supplies to ships, and a saving of money due to the fact that all purchases under the fund are made only after public advertisement.

The commissioning of ships is attended with less confusion and delay than formerly, owing to regulations put in force during the past year requiring that all articles of outfit and supplies intended for vessels be procured and assembled by the Bureau of Supplies and Accounts at the fitting-out yard in advance of the completion of the vessel. Under these regulations as now enforced there is no reason why a ship's outfit should not be put on board, and the ship ready for service, so far as her necessary stores are concerned, within twenty-four hours from the time the order to put her in commission is given. As the same regulations will hereafter be in operation for vessels in reserve, the mobilization of a fleet should be effected with great rapidity.

In view of the importance and the greatly increased volume of the business transacted by the Bureau of Supplies and Accounts, and in order to expedite the business of the Department, I approve of the recommendation made by the Paymaster-General that Congress be asked to authorize the assignment of an officer of the Pay Corps to duty as Assistant Chief of the Bureau of Supplies and Accounts, with authority to act as Chief of the Bureau in the absence of the Paymaster-General.

LABOR AT NAVY YARDS.

Every facility has been afforded by the Department for carrying out the provisions of the regulations relating to the employment of labor at the navy-yards. The report of the Board of Labor at the Norfolk navy-yard for the year ending September 1, 1893, shows that out of 1,506 men certified for employment 401 failed to report for work. Out of 1,111 certified to the heads of departments in the New York navy-yard 347 did not respond, and a like proportion in the other navy-yards failed to report for employment in response to notices sent. This caused delay in procuring labor when needed and suggested a modification of the rules. According to the rules as adopted by my predecessor, the names of applicants remained on the register indefinitely. As the applications were greatly in excess of the needs of the Government, and as it was often necessary to call for laborers whose names had been on the register for nearly two years, it is obvious that there were many reasons, such as death, change of residence, obtaining other employment, etc., why persons on the register should fail to appear. The regulations were therefore amended by ordering that, as is provided in the rules governing the Civil Service Commission, the names of applicants should remain on the register only one year. Other amendments to the rules may be suggested by the careful scrutiny to which they are being constantly subjected by the Department.

There is no doubt that the system of employing laborers without reference to their politics and making merit the sole test of their retention and advancement is greatly to the benefit of the Government. Unless some such system as this be followed, there is no practicable method except to take the recommendations of members of Congress who are better acquainted with and have more knowledge of their constituencies than any other persons to whom the head of a Department has access. Senators and Representatives, interested as they are in the success of the Government and of their party, as a rule, it may be safely presumed, will only recommend those whom they believe to be competent for places under the Government, but the knowledge they have of the capacity of laborers to build and repair ships is generally restricted within very narrow limits. They certainly can not judge of the competency of laborers with as much accuracy as they display in selecting persons for clerical places, and everyone knows that in this, though actuated by the best intentions, they make frequent mistakes.

A misfortune of the method of taking on laborers to oblige their friends, and not because of their capacity or skill, is that the influence that procures an appointment is frequently used to secure the retention of an incompetent employé.

It is not practicable to estimate accurately the value of the present system of employing labor at navy-yards, but it certainly is an improvement upon former methods. Every officer of the Navy with whom I have consulted favors it; especially those who have had recent experience in navy-yards. And yet experience and the constant investigations being made will doubtless suggest modifications.

Generally, the regulations adopted by my predecessor seem to have been fairly complied with. Recent developments, however, have shown some violations of the rules at the Washington navy-yard. It is the purpose of the Department to investigate thoroughly every case of alleged irregularity, and when infractions of the rules are established such steps will be taken and such orders issued as will prevent repetition of the offenses. It is hoped that results will be such as to satisfy all parties of the propriety and policy of making merit the sole test by which labor is employed and retained in our navy-yards.

The one misfortune connected with the promulgation of these rules is that, at the time of their adoption, the employés were not equally divided between the two great political parties. If such division had first been made and the system then put in force it is not believed that even a plausible argument could be made for a return to former methods. It is perhaps too much, however, to expect that such a fair division should first have been made. No new method would ever be tried if its adoption depended on conditions that never existed.

NAVY-YARD PLANTS.

The few improvements of navy-yard plants recommended are such as will maintain them in good condition to do repair work only. Competition between shipbuilders is now very sharp, and at present rates they can build more economically than can be done at Government yards. Sound policy would, therefore, seem to require that any new vessels Congress may see fit to authorize shall be let out by private contract, especially as, in the event of a foreign war, the Government would be compelled to rely on private yards for hurried extensive repairs and any desirable increase of vessels.

During the past season I visited and inspected personally the navy-yards at Brooklyn, Boston, and Portsmouth, the naval station at New London, and the war college, torpedo station, and training school at Newport. It is my intention to pay similar visits of inspection at an early day to the navy-yards at League Island, Norfolk, and Mare Island. This latter yard will require some appropriations to enable it to do the additional work assigned to it. Formerly, vessels cruising in Asiatic waters when they needed repairs were compelled to make long cruises around Cape Horn or through the Suez Canal to reach the navy-yards on our eastern coast. To save expense, I have ordered that all the ships of the Asiatic Squadron, when in need of repairs impossible to have made abroad, shall be sent to the Mare Island navy-yard.

EXAMINATIONS FOR PROMOTION.

The present system of examination for promotion in the Navy being in some respects faulty, I have the honor to recommend that Congress be requested to provide that the "Act to provide for the examination of certain officers of the Army and to regulate promotions therein," approved October 1, 1890, which was subsequently, by the act approved July 28, 1892, made applicable to the Marine Corps, be further made applicable to the Navy; it is also recommended that the above acts be so amended that in cases where the board finds a candidate physically disqualified for promotion, and accordingly resolves itself into a retiring board, it shall be its duty to examine into the record of the candidate, so far as may be necessary, to ascertain whether or not his physical inability to perform at sea the duties of the place to which it is proposed to promote him is the result of drunkenness or any other cause arising from his own misconduct.

It is further recommended that the law for the examination of officers as to their physical, mental, moral, and professional qualifications for promotion be made to embrace passed assistant surgeons upon their promotion to the grade of surgeon, and chief engineers upon their promotion to higher relative rank in that grade.

Applicants for the position of assistant surgeon in the Navy are now subjected to an extremely rigid examination and rightfully so, as the sanitary condition of ships and often the health and lives of those on board depend upon the knowledge and skill of the medical officers of a vessel. About three years after admission to the grade of assistant surgeon, medical officers are subjected to an examination for the grade of passed assistant surgeon. Then they pass through the grades of passed assistant surgeon and surgeon, an average period of over thirty-one years of service, including promotion without any examination whatever, mental, moral, or physical, until they apply for the position of medical inspector. There seems to be no good reason why medical officers should not be required like others to affirmatively show their qualifications for promotion.

LIVE OAK RESERVATIONS.

For many years a number of tracts of land in the States of Florida, Alabama, and Mississippi have been reserved from the public domain for the use of the Navy Department as a source of supply of live-oak timber.

As the lands seem now to be of no practical value for the purpose for which they were reserved, I have the honor to suggest the advisability of restoring them to the public domain and opening them to settlement.

CERTIFIED CHECKS.

It has come to the knowledge of the Department that many large dealers are deterred from bidding for contracts to furnish small quantities of articles required for use in the naval service, because the trouble and inconvenience in securing suitable bondsmen is out of all proportion to the amount involved in the contract.

Section 3719 of the Revised Statutes provides that every proposal for naval supplies, invited by the Secretary of the Navy, * * * shall be accompanied by a written guaranty, signed by one or more responsible persons, to the effect that he or they undertake that the bidder, if his bid is accepted, will, at such time as may be prescribed by the Secretary of the Navy, give bond, with good and sufficient sureties, to furnish the supplies proposed; and no proposal shall be considered unless accompanied by such guaranty.

It is respectfully recommended that the provisions contained in this section be so far modified as to allow the Department to accept certified checks, covering the entire amount of the contract, in lieu of the guarantee and bonds now made compulsory by the Revised Statutes. The security of the interests of the Government would be amply protected by certified checks, and the reluctance of many large dealers to submit proposals and enter into contract under existing laws would be overcome.

By inducing large firms to bid for supplies competition is encouraged, and a better class of articles is secured without additional cost to the Government.

COMPULSORY ATTENDANCE OF CIVILIANS.

In many cases brought to trial before naval courts it has been found that evidence which would be of the greatest importance in establishing the innocence or guilt of the accused is entirely confined within the knowledge of civilians; and under existing statutes their personal attendance at the trial is not compulsory. Thus the ends of justice are frequently defeated by the reluctance of civilians to testify before a naval court.

Congress has conferred upon the judge-advocate of an army court the power to subpœna civilian witnesses, but has failed to authorize the court to punish such witnesses for contempt in case they refuse to testify.

It is respectfully recommended that a provision be enacted authorizing the judge-advocate of a naval court to subpœna civilian witnesses and empowering the court to punish such witnesses for contempt in case they refuse to testify. By means of such a provision it will be possible to administer law and justice in many cases which under existing statutes it is not practicable to reach.

DEPOSITION—MEMORANDUM.

The established form of procedure in naval general courts-martial is to summon all witnesses whose testimony is desired in any case under consideration, and to require the witness to give his testimony orally and in the hearing of the accused. While it is preferable to follow the custom of taking testimony in open court, in all cases where it is feasible, there are times when it is not only inconvenient but almost impossible to do so.

As the articles for the government of the Navy in regard to the organization of a naval general court-martial must be adhered to strictly, it is not an uncommon occurrence for a period of several months to elapse between the date on which the offense is committed and the convening of the court. During this period it sometimes happens that important witnesses are relieved from duty in the vicinity and sent on distant service. To obtain their testimony at the trial it then becomes necessary to recall them from such duty and frequently, at great delay and expense.

Article 91 of the Articles of War provides that "the depositions of witnesses residing beyond the limits of the State, Territory, or district in which any military court may be ordered to sit, if taken on reasonable notice to the opposite party and duly authenticated, may be read in evidence before such court in cases not capital."

The articles for the government of the Navy do not provide for such an emergency, and the enactment of a similar provision would not only avoid the delay and expense incidental to the personal attendance of the witness at the trial, but it would place within reach of the court evidence which it is now impracticable to obtain, thus materially furthering the administration of law and justice.

It is suggested that if this regulation be made applicable to the Navy the words "or who, being in the naval or military service of the United States, shall be stationed more than 100 miles from the place of trial, or shall be at sea, or under orders for sea," be inserted therein after the word "sit" and before the word "if."

The Judge-Advocate-General of the Navy suggests that in the interests of economy and convenience the following be enacted into law, and the Department approves the suggestion:

> That judges-advocate of naval general courts-martial and courts of inquiry, and all commanders in chief of naval squadrons, commandants of navy-yards and stations, and officers commanding vessels of the Navy, are hereby authorized to administer oaths for the purposes of the administration of naval justice, and for other purposes of naval administration.

LIMITATION OF PUNISHMENTS.

A recent statute relating to the Army contains the following provision:

> That whenever by any of the Articles of War for the government of the Army, the punishment on conviction of any military offense is left to the discretion of the court-martial, the punishment therefor shall not, in time of peace, be in excess of a limit which the President may prescribe.

The President has, under the provisions of the above-mentioned statute, by an Executive order published in General Orders No. 21, dated March 28, 1891, limited the amount of punishment to be awarded by a court-martial in many cases of common occurrence in the Army. The effect of the order has been most satisfactory; whereas, before the passage of the act empowering the President to prescribe the limits of punishment to be awarded in certain cases, there was such a lack of uniformity in the sentences imposed, owing to the diversity of opinion of the general courts-martial, that it frequently happened that the punishments awarded for the same offense differed widely in severity. As a consequence there is now so much greater uniformity in the administration of justice in the Army that the Judge-Advocate-General of the War Department, in a recent report, refers to the change as marking a most important era in the history of that branch of the public service.

While it is possible for the revising authority to regulate and thus to secure in some degree uniformity in the punishment of offenses, this method has been found in practice to be unsatisfactory. An unwritten rule resting only in the breast of a judge can never be definite or uniform in application; especially is this so when no one person can be expected for any long period of time to exercise the revising authority.

It is respectfully recommended that a provision similar to the one quoted above in regard to the Army be enacted for the Navy.

UNITED STATES NAVAL OBSERVATORY.

I beg to recommend certain legislation which, without cost to the Government, will greatly benefit the United States Naval Observatory.

In order to insure, within practicable limits, the success of astronomical observations, the delicate instruments used in observing should be protected against smoke, unusual currents of heated air, and undue vibrations from traffic upon public thoroughfares in the vicinity. These essential safeguards, experiments have shown, can be secured only by controlling a circle described with a radius of at least 1,000 feet from the central point of the building, and allowing within it no public streets, avenues, or thoroughfares.

The Government land on which the Naval Observatory has been established, though ample in extent, will not as it is now shaped admit of giving on all sides the protection desired, but an act of Congress conferring the needed authority will enable the Department to acquire without any appropriation the 20 acres necessary to complete the circle. Such an act would confer power to sell lands which are not only outside of the desired circle, but which by the proposed extension of Massachusetts avenue would be cut off from the Observatory tract, and to buy with the proceeds of this sale land lying within the circle on the opposite side. The land proposed to be sold is of greater [illegible] than that which it is proposed to buy, which latter would not include the grounds of the Industrial Home School. These, although within the circle indicated, will not be used for purposes detrimental to the Observatory.

It is therefore recommended that authority be granted by Congress to dispose of the ground which would be cut off by the extension of Massachusetts avenue on the most advantageous terms, and to use the money derived from such sale in the purchase of the additional land needed in other directions to complete the prescribed circle herein indicated. To prevent extortion it is recommended that the act confer authority to institute condemnation proceedings against such of the desired lands as can not be otherwise procured at a fair valuation, and it is also suggested that Congress shall authorize the Department to convey for a fair equivalent the right to extend Massachusetts avenue through the grounds of the Observatory on lines already laid out.

The Department is prepared to submit to Congress detailed information bearing upon this subject and a draft of proposed legislation to accomplish the measures recommended.

LIQUID FUEL.

The Italian Government is using, with great success, especially for torpedo boats, liquid fuel, petroleum refuse, obtained from Russia. The Department has had this subject investigated with the hope that it might be found practicable to use this fuel in our own Navy, but it is found that it will be impossible to obtain, in the United States, any available supply of this substance.

The quality of the American petroleum is so much higher than that of the Russian that there is no refuse from the former of the character produced from the latter. Almost the whole of the American petroleum is utilized: any residuum that remains is of a solid character, small in quantity, and generally used as a fuel at the producing establishment. The quantity, however, is so small that it can have no commercial standing.

The total of the refuse from the oil wells of Russia is estimated at about 1,000,000 tons. Only a moderate portion of this is exported beyond the Russian dominions. That obtained by Italy is at a cost of from $12 to $14 per ton.

It is undoubtedly an ideal fuel, but in the present circumstances of small quantity produced, cost, and the distance from point of production, it is out of the question for us to use it, unless on such a limited scale that it would be of no practical value.

NAVY DEPARTMENT EXHIBIT, WORLD'S COLUMBIAN EXPOSITION.

At the suggestion of Commodore R. W. Meade, U. S. Navy, the space in the Government Building which was to have been assigned to the Navy Department was surrendered to the other Departments, and a structure of brick, iron, and cement was built on piles in Lake Michigan, off the Fair Grounds, having the same dimensions and lines, as far as practicable, as the coast line battle ships *Indiana*, *Massachusetts*, and *Oregon*.

This brick model of a battle ship was named the *Illinois*. Guns, boats, anchors, chains, search lights, compasses, and other appropriate man-of-war fittings were exhibited in place on the main deck and upon the superstructure, while on the berth deck were placed the exhibits of the different bureaus of the Navy Department and also many articles voluntarily offered for exhibition by different companies throughout the United States having plants producing articles needed for naval purposes.

On shore near this brick vessel was built a naval observatory, consisting of three small buildings containing the principal instruments and appliances of an astronomical institution, from which was operated daily a time ball on the Government building. Near to the observatory was a camp of 60 United States marines, all of the above forming the United States naval exhibit.

The officers, sailors, and marines connected with the care of the naval exhibit have acquitted themselves with credit to the naval service.

The idea of a brick representation of our new battle ships was advanced by Commodore Meade, and the value of the suggestion has been clearly demonstrated by the number of visitors to the brick ship during the time of the Exposition. The daily attendance averaged nearly 20,000, on one day reaching as high as 67,000. More than 3,000,000 people visited the vessel during the time of the Fair.

The Department feels satisfied that the naval exhibit at Chicago has proved a source of instruction to people of the interior which could not have been improved upon.

MISCELLANEOUS RECEIPTS FOR GOVERNMENT PROPERTY.

In the appendix will be found a detailed statement, prepared by the Fourth Auditor of the Treasury, of deposits in the Treasury, from November 1, 1892, to November 1, 1893, arising from the sale of condemned vessels, stores, and materials; from gains on exchange, interest, and rents; from supplies furnished to and work performed for other branches of the Government; and from other lawful disposition of public property under the cognizance of the Navy Department.

The total amount so deposited was $112,934.22, of which the sum of $56,331.69 was covered into the Treasury as "miscellaneous receipts on account of proceeds of public property," as required by section 8 of
the Revised Statutes, and the remainder, $56,602.53,
ized by law to the credit of the proper appropri
naval purposes.

SALE OF CONDEMNED VESSELS.

As stated in the last annual report of this Department, the only offer made for the tug *Ivy*, at Mare Island, amounting to $1,305, was accepted and the vessel delivered to the purchaser. The appraised value of the vessel was $1,000. The expense of advertising for proposals for the purchase of the *Ivy* and the *Mayflower*, for which latter vessel no offer was received, amounted to $166.65. After paying the expenses of advertising, the net proceeds $1,138.35, were covered into the Treasury, in accordance with section 3618 of the Revised Statutes, as "Miscellaneous receipts on account of the sale of Government property." An account of the payments for advertising and deposit of net proceeds of the sale will be found in the Appendix to this report.

The *Palos*, which had been condemned as unfit for further service, was duly advertised for sale on the Asiatic station. Her appraised value was $7,000, but the highest offer received under the advertisement was 6,000 silver yen—less than the appraised value. It was deemed to the interest of the Government to dispose of the vessel without further delay, and under the authority of the President, the commanding officer of the Asiatic station was cabled, on the 6th of January to accept the highest offer. He succeeded in obtaining an offer of 7,000 silver yen, and accepted it. After paying all expenses connected with the sale, the net proceeds realized, amounting to $5,145.10, were deposited by the pay officer in charge and covered into the Treasury, in pursuance of the section of the Statutes above mentioned.

On the 17th June last, the tug *Phlox* at Annapolis, appraised at $2,000, was advertised for sale, but no offer was received. She will be made use of at the Academy.

The tug *Mayflower* for which no bid was obtained under advertisement of October 20, 1892, has been reappraised and proposals invited for her purchase.

ESTIMATES AND APPROPRIATIONS.

For the fiscal year ending June 30, 1895, the estimates for the Navy and Marine Corps, including increase of the Navy and public works, amount to $27,885,914.02, as will be seen from the following tabular statement.

The estimates for the same purposes for the current fiscal year amounted to $24,471,498.21, or $3,414,415.81 less than those for the next fiscal year.

For the current fiscal year the estimates for increase of the Navy amounted to $9,703,657, and for the next fiscal year they amount to $12,455,025, the difference being $2,751,368.

The estimates for the running expenses of the Navy and Marine Corps, including improvements at navy-yards and stations for the next fiscal year, amount to $15,430,889.02, being $663,047.81 in excess of the estimates of the current fiscal year.

Comparative exhibit of estimates and appropriations, 1894 and 1895.

Detailed objects of expenditure and explanation.	Estimates, 1894.	Appropriations, 1894—current year.	Estimates, 1895.
General establishment:			
Pay of the Navy	$7,300,000.00	$7,300,000.00	$7,475,000.00
Pay, miscellaneous	240,000.00	240,000.00	240,000.00
Contingent, Navy	7,000.00	7,000.00	7,000.00
Bureau of Yards and Docks:			
Ordinary expenses	569,453.14	375,709.54	703,809.54
Public Works	757,683.00	1,045,244.00	403,831.00
Bureau of Navigation:			
Ordinary expenses	163,750.00	103,000.00	276,750.00
Naval Academy	219,488.65	187,065.45	197,101.45
Bureau of Equipment	956,025.00	950,025.00	1,131,025.00
Bureau of Ordnance	429,324.00	324,824.00	645,801.00
Bureau of Construction	969,972.50	969,972.50	919,972.50
Bureau of Steam Engineering	739,900.00	707,900.00	1,017,900.00
Bureau of Supplies and Accounts	1,273,892.03	1,197,532.03	1,287,532.03
Bureau of Medicine and Surgery	125,000.00	105,000.00	125,000.00
Marine Corps:			
Pay Department	713,469.63	696,478.36	702,000.00
Quartermaster's Department	286,383.26	254,210.50	264,210.00
Naval Observatory	16,500.00	16,500.00	23,956.00
Hydrographic Office	....	....	10,000.00
Total running expenses	14,767,841.21	14,486,461.38	15,430,889.02
Increase Navy:			
Bureau of Equipment	555,305.00	250,000.00	....
Bureau of Ordnance	2,000,000.00	200,000.00	6,500,000.00
Construction and machinery	7,148,352.00	6,875,000.00	5,955,025.00
Total Increase Navy	9,703,657.00	7,325,000.00	12,455,025.00
Grand total	24,471,498.21	21,811,461.38	27,885,914.02

The total amount given in the foregoing statement as the appropriations for the current fiscal year does not include the appropriation of $300,000 for the Naval Review, $200,000 for naval-supply fund, and $192,600 continuous appropriations included in the digest, which gives the total appropriations for 1893-'94 for the naval service as $22,504,061.38.

It will be seen from the above that the estimates for the coming year, when items in last year's appropriations and not in these estimates are included, are $5,381,852.64 in excess of the appropriations for the present fiscal year. In the preparation of these estimates every effort has been made to reduce each item to the lowest possible point, and yet I am convinced that no smaller amounts than herein designated will suffice for the actually necessary expenditures of this Department.

The excess of these estimates over the appropriations for the present fiscal year is due to the fact that only $200,000 was appropriated by the act of March 3, 1893, for ordnance, under "inc[illegible]e navy," wh[illegible], under same head, $6,500,000 will be requir[illegible] du[illegible] year. This great difference results from failure of armor contractors to supply armor large balances had accumulated to the credit of this fund, and these balances heretofore appropriated are being utilized to pay for armor and armament coming in during the present year. The sum carried in the present estimates, $6,500,000, will be all needed, because of the prompt deliveries of armor and armament now being made, and it will pay in full for all the guns and armor required for all the vessels heretofore authorized.

Appropriations, expenditures, and balances, fiscal year ending June 30, 1893.

	Appropriations for fiscal year ending June 30, 1893, exclusive of public works	Amount drawn fiscal year ending June 30, 1893.	Balances undrawn June 30, 1893.	Balances undrawn October 31, 1893.
Pay of the Navy	$7,300,000.00	$5,681,980.33	$1,618,019.67	$734,458.79
Pay, miscellaneous	240,000.00	237,631.23	2,368.77	3.61
Contingent, Navy	7,000.00	1,572.76	5,427.24	5,100.93
Marine Corps:				
Pay	687.540.85	574,666.60	112,874.25	66,397.27
Provisions	71,188.63	71,185.98	2.65	124.05
Clothing	75,000.00	73,604.28	1.395.72	3,172.64
Fuel	19,500.00	19,500.00	....	466.52
Military stores	13,286.50	13,148.42	138.08	162.13
Transportation and recruiting	14,000.00	13,921.51	78.49	172.26
Repairs of barracks	16,512.00	14,709.23	1,802.77	1,288.62
Forage	2,800.00	2,800.00	....	....
Hire of quarters	6,624.00	6,624.00	....	....
Contingent	27,500.00	27,426.83	73.17	94.38
Naval Academy:				
Pay	104,265.45	104,200.00	65.45	55.97
Special course	5,000.00	1,699.80	3,300.20	2,340.51
Repairs	21,000.00	19,214.66	1,785.34	284.08
Heating and lighting	17,000.00	16,605.35	394.65	32.18
Contingent	41,800.00	35,985.81	5,814.19	1,920.62
Navigation:				
Transportation, recruiting, and contingent	40,000.00	26,364.94	13,635.06	8,728.91
Gunnery exercises	6,000.00	4,318.50	1,681.50	167.37
Naval training station	18,000.00	17,881.00	119.00	.95
Naval war college and torpedo school	8,000.00	3,894.37	4,105.63	77.25
Ordnance:				
Ordnance and ordnance stores	155,000.00	115,625.20	39,374.80	34,506.82
Repairs	30,000.00	29,274.59	725.41	233.08
Torpedo station	60,000.00	54,422.64	5,577.36	3,300.72
Civil establishment	26,824.00	26,168.00	656.00	699.95
Contingent	8,000.00	5,946.18	2,053.82	274.70
Equipment:				
Equipment of vessels	925,000.00	717,333.72	207,666.28	77,053.39
Civil establishment	19,025.00	19,024.96	.04	118.27
Contingent	12,000.00	5,439.87	6,560.13	3,855.04
Yards and Docks:				
Maintenance	230,000.00	210,930.48	19,069.52	3,564.59
Civil establishment	61,380.69	60,602.70	777.99	1,278.49
tingent	15,000.00	14,085.19	914.81	666.37
ral Home, Philadelphia, Pa	70,215.00	53,326.95	16,888.05	2,999.18
and preservation at navy-[illegible]	275,000.00	238,488.41	36,511.59	1,237.66

Appropriations, expenditures, and balances, fiscal year ending June 30, 1893.—**Cont'd.**

	Appropriations for fiscal year ending June 30, 1893, exclusive of public works.	Amount drawn fiscal year ending June 30, 1893.	Balances undrawn June 30, 1893.	**Balances undrawn October 30, 1893.**
Medicine and Surgery:				
Medical department	$55,000.00	$53,444.62	$1,555.38	**$20.37**
Repairs	20,000.00	13,327.32	6,672.08	**10.38**
Contingent	25,000.00	19,375.00	5,625.00	**3.00**
Supplies and Accounts:				
Provisions, Navy	1,090,000.00	925,991.80	164,008.20	**21,731.89**
Civil establishment	67.532.03	66,335.19	1,196.84	**1,477.50**
Contingent	40.000.00	30,933.89	9.066.11	**759.34**
Construction and Repair:				
Construction and repair	950,000.00	850,354.17	99,645.83	**25,077.78**
Civil establishment	19,972.50	18.871.37	1.101.13	**1,105.26**
Steam Engineering:				
Steam machinery	650,000.00	588,238.97	61,761.03	**21,398.07**
Civil establishment	11,900.00	11,799.33	100.67	**149.98**
Contingent	1,000.00	736.97	263.03	**60.91**
Total	13,559,866.65	11,099,013.12	2,460,853.53	**1,026,691.78**

As will be seen from the foregoing exhibit—

The appropriations for current expenses for the fiscal year ending June 30, 1893, exclusive of public works, amounted to		**$13,559,866.65**
Drawn by requisition to June 30, 1893		**11,099,013.12**
Balance undrawn July 1, 1893		**2,460,853.53**
Drawn by requisition from July 1 to October 31, 1893		**1,434,161.75**
Balance undrawn November 1, 1893		**1,026,691.78**
In addition to the undrawn balance on November 1, 1893, there was in the hands of disbursing officers on that date		5,577.79
Making the available balance		**1,032,269.57**
It is estimated that the following sums are due from this balance:		
From pay of the Navy to officers and men	$594,654.11	
From pay of the Marine Corps to officers and men	41,157.80	
From other appropriations for outstanding liabilities	150,000.00	
		785,811.91
Apparent available balance		**246,457.66**

This balance may be reduced when all the accounts pertaining to the fiscal year have been finally adjusted.

PUBLICATION OF THE NAVAL WAR RECORDS.

Under the authority of Congress the work of collecting and classifying the naval records of the civil war has been continued during the past year, and the Department is now prepared to begin the publication of these very important papers. A small appropriation has been requested to defray the expenses of commencing this publication.

The report of Lieut. Commander Richard Rush, U. S. Navy, superintendent of the naval war records, is herewith appended, and I renew most earnestly the recommendation of former Secretaries of the Navy in commending this important work to the consideration of Congress. It is remarkable that when so much interest is taken in collecting and publishing the history of the Army during the civil war the achievements of the Navy, equally deserving of recognition, should have remained so long unpublished.

HILARY A. HERBERT,
Secretary of the Navy.

SECRETARY'S OFFICE. ESTIMATES, PROPOSALS, AND CONTRACTS.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Navy Department.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
SALARIES, OFFICE OF SECRETARY OF THE NAVY.			
Secretary (appropriated, Vol. 27, p. 701, March 3, 1893)	$8,000		
Assistant secretary (same act)	4,500		
Chief clerk (same act)	2,500		
Clerk to the secretary (same act)	2,250		
Disbursing clerk (same act)	2,250		
Two clerks of class four (same act)	3,600		
One clerk of class four, in charge of files, record, and supplies, increase of $200, submitted (same act)	2,000		
Two clerks of class three (same act)	3,200		
One stenographer (same act)	1,600		
One stenographer (same act)	1,400		
One clerk of class two (same act)	1,400		
Four clerks of class one (same act)	4,800		
One clerk (same act)	1,000		
One telegraph operator (same act)	1,000		
One carpenter (same act)	900		
Two messengers at $840, each (same act)	1,680		
Three assistant messengers at $720, each (same act)	2,160		
Two messenger boys at $420, each (same act)	840		
One messenger boy (same act)	360		
One laborer (same act)	660		
One clerk of class two for Inspection Board (same act)	1,400		
One laborer for Inspection Board (same act)	660		
One clerk of class one for Examining and Retiring Board (same act)	1,200		
		$49,360	$49,160
CONTINGENT EXPENSES, NAVY DEPARTMENT.			
For stationery, furniture, newspapers, plans, drawings, drawing materials, horses and wagons to be used only for official purposes, freight, expressage, postage, and other absolutely necessary expenses of the Navy Department and its various bureaus and offices		12,000.00	11,000.00
PRINTING AND BINDING.			
Printing and binding for the Navy Department, including $12,000 for the Hydrographic Office, to be executed under the direction of the Public Printer		70,000.00	70,000.00
SALARIES, OFFICE OF JUDGE-ADVOCATE-GENERAL.			
Chief clerk (in lieu of one clerk of class four.) (R. S., p. 27, sec. 167; June 8, 1881, Vol. 21, p. 164, sec. 1; Mar. 3, 1893, Vol. 27, p. 701, sec. 1)	1,800.00		
One clerk of class four (same acts)	1,800.00		
One clerk of class three (same acts)	1,600.00		
One clerk of class three (submitted)	1,600.00		
One clerk of class two (R. S., p. 27, sec. 167; June 8, 1881, Vol. 21, p. 164, sec. 1; Mar. 3, 1893, Vol. 27, p. 701, sec. 3)	1,400.00		
Two clerks of class one (same acts)	2,400.00		
One clerk (same acts)	1,000.00		
One laborer (same acts)	660.00		
		12,260.00	10,660.00

NOTE.—The designation of one of the clerks of class 4 as chief clerk is desirable, in order that such designation may conform to the nature of his duties, and does not involve any increase in compensation or in the appropriations made for this office.

In consequence of the large amount of work devolving upon the office of the Judge-Advocate-General, in connection with contracts growing out of recent acts of Congress providing for the increase of the Navy, the services of an additional law and contract clerk are rendered necessary, and an estimate for an additional clerk of class 3 is accordingly submitted.

Estimates of appropriations required for the service of the fiscal year, etc.—**Continued.**

Detailed objects of expenditures, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
LIBRARY OF THE NAVY DEPARTMENT.			
Salaries:			
Library of the Navy Department (March 3, 1893, Vol. 27, p. 701)			
One clerk at $1,000 (same act)	$1,000.00		
One assistant messenger at $720 (same act)	720.00		
One laborer at $660 (same act)	660.00		
		$$2,380.00	$$2,380.00
For professional books and periodicals for the library (same act)	1,000.00	1,000.00	500.00
OFFICE OF NAVAL RECORDS OF THE REBELLION.			
Salaries:			
Office of Naval Records of the Rebellion (March 3, 1893, Vol. 27, p. 701)			
Two clerks of class 4 (same act	3,600.00		
One clerk of class 3 (same act)	1,600.00		
Two clerks of class 2 (same act)	2,800.00		
Two clerks of class 1 (same act)	2,400.00		
One clerk at $1,000 (same act)	1,000.00		
Two copyists at $900 each (same act)	1,800.00		
Four copyists at $720 each (same act)	2,880.00		
Necessary traveling and incidental expenses for collection of records (same act)	600.00		
		16,680.00	16,680.00
Additional estimate: For beginning the publication of the official Naval Records of the Rebellion, both Union and Confederate. These records have been collected with great care and labor, and at large expense. They are now ready in part for publication. (Submitted)	15,000.00	15,000.00	
PAY OF THE NAVY.			
Pay of officers on sea duty; officers on shore and other duty; officers on waiting orders; officers on the retired list; clerks to commandants of yards and stations; clerks to paymasters at yards and stations, general storekeepers, receiving ships, and other vessels; extra pay to men reënlisting under honorable discharge; interest on deposit by men; pay of petty officers, seamen, landsmen, and boys, including men in the engineer's force, and for the Coast Survey service and Fish Commission, eight thousand two hundred and fifty men and seven hundred and fifty boys, at the pay prescribed by law (R. S., p. 246 sec. 1367; R. S., p. 248, sec. 1386-8; R. S., p. 265, sec. 1556; R. S., p. 269, sec. 1569; R. S., p. 269, sec. 1573; May 12, 1879. R. S., p. 272, sec. 1595; Aug. 5, 1882, Vol. 21, p. 3, sec. 1; Mar. 3, 1883, Vol. 22, p. 285-7, sec. 1; Mar. 3, 1885, Vol. 22, p. 472-3, sec. 1; Mar. 2, 1889, Vol. 23, p. 340, sec. 1; July 19, 1892, Vol. 25, p. 809, sec. 1; Mar. 3, 1893, Vol. 27, p. 236, sec. 1)	7,475,000.00	7,475,000.00	7,300,000.00

NOTE. The foregoing estimate is made up as follows:

Pay of 1,494 officers on the active list	$3,428,600
Pay of 292 naval cadets under instruction	146,000
Pay of 402 officers on the retired list	886,816
Pay of 96 clerks	123,500
*Pay of 9,000 petty officers, seamen, and other enlisted men, including apprentices in cruising vessels, training ships, and at the training station	2,738,895
Extra pay of petty officers and seamen reënlisting under honorable discharge	141,189
To pay interest on deposits by men (act Feb. 9, 1889)	10,000
	7,475,000

*NOTE.—The increase in this amount over the amount appropriated for the year ending June 30, 1894, is due to the actual estimate of that year having been reduced $151,131, and to the total number of enlisted persons in the Navy having been increased by the act of Mar. 3, 1893, from 8,250 to 9,000.

Estimates of appropriations required for the service of the fiscal year, etc.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
PAY MISCELLANEOUS.			
For commissions and interest; transportation of funds; exchange; mileage to officers while traveling under orders in the United States, and for actual personal expenses of officers while traveling abroad under orders, and for traveling expenses of apothecaries, yeomen, and civilian employés, and for actual and necessary traveling expenses of naval cadets while proceeding from their homes to the Naval Academy for examination and appointment as cadets; for rent and furniture of buildings and offices not in navy-yards; expenses of courts-martial, prisoners and prisons, and courts of inquiry, boards of investigation, examining boards, with clerks' and witnesses' fees, and traveling expenses and costs; stationery and recording; expenses of purchasing paymasters' offices of the various cities, including clerks, furniture, fuel, stationery, and incidental expenses; newspapers and advertising; foreign postage; telegraphing, foreign and domestic; telephones; copying; care of library, including purchase of books, photographs, prints, manuscripts, and periodicals; ferriage tolls and express fees; cost of suits; commissions, warrants, diplomas, and discharges; relief of vessels in distress; canal tolls and pilotage; recovery of valuables from shipwrecks; quarantine expenses; reports; professional investigation; cost of special instruction, at home or abroad, in maintenance of students and attachés and information from abroad, and the collection and classification thereof, and other necessary incidental expenses; in all, $240,000. And hereafter the accounting officers of the Treasury are hereby authorized to credit appropriation "Pay miscellaneous," with all receipts for interest on the account of the Navy Department with the London fiscal agents, premiums arising from sales of bills of exchange, and from any appreciation in the value of foreign coin. And fraudulent enlistment, and the receipt of any pay or allowance thereunder, is hereby declared an offense against naval discipline and made punishable by general court-martial, under article 22 of the articles for the government of the Navy		$240,000.00	$240,000.00
CONTINGENT NAVY.			
For all emergencies and extraordinary expenses arising at home or abroad, but impossible to be anticipated or classified, exclusive of personal services in the Navy Department or any of its subordinate bureaus or offices at Washington, D. C., $7,000		7,000.00	7,000.00

Estimate of the amount required to pay the officers of the United States Navy for the fiscal year ending June 30, 1895.

ACTIVE LIST.

No.	Grade.	Sea duty.			Other duty.		
		No.	Pay per annum	Total.	No.	Pay per annum.	Total.
6	Rear admirals	3	$6,000	$18,000	3	$5,000	$15,000
1	Commodore, chief of bureau				1	5,000	5,000
9	Commodores	2	5,000	10,000	7	4,000	28,000
2	Captains, chiefs of bureau				2	5,000	10,000
43	Captains	16	4,500	72,000	27	3,500	94,500
1	Commander, chief of bureau				1	5,000	5,000
1	Commander, assistant chief of bureau				1	3,500	3,500
83	Commanders	22	3,500	77,000	61	3,000	183,000
50	Lieutenant-commanders, after 4 years	22	3,000	66,000	28	2,600	72,800
24	Lieutenant-commanders, first 4 years	5	2,800	14,000	19	2,400	45,600
204	Lieutenants, after 5 years	104	2,600	270,400	100	2,200	220,000
46	Lieutenants, first 5 years	21	2,400	50,400	25	2,000	50,000
23	Lieutenants, junior grade, after 5 years	10	2,000	20,000	13	1,700	22,100
1	Lieutenant, not in line of promotion	1	2,000	2,000			
52	Lieutenants, junior grade, first 5 years	31	1,800	55,800	21	1,500	31,500
181	Ensigns, after 5 years	112	1,400	156,800	69	1,200	82,800
79	Naval cadets, undergraduates	79	950	75,050			
15	Medical directors, after 20 years from date of commission as surgeon				15	4,000	60,000
1	Medical inspector, chief of bureau				1	5,000	5,000
4	Medical inspectors, fleet surgeons	4	4,400	17,600			
10	Medical inspectors	1	4,200	4,200	9	4,000	36,000
10	Surgeons, fourth 5 years	5	3,700	18,500	5	3,600	18,000
12	Surgeons, third 5 years	3	3,500	10,500	9	3,200	28,800
15	Surgeons, second 5 years	9	3,200	28,800	6	2,800	16,800
13	Surgeons, first 5 years	4	2,800	11,200	9	2,400	21,600
2	Surgeons, not in line of promotion				2	2,400	4,800
37	Passed assistant surgeons, after 5 years	18	2,200	39,600	19	2,000	38,000
21	Passed assistant surgeons, first 5 years	14	2,000	28,000	7	1,800	12,600
28	Assistant surgeons, first 5 years	18	1,700	30,600	10	1,400	14,000
1	Pay director, chief of bureau				1	5,000	5,000
12	Pay directors, after 20 years from date of commission as paymaster				12	4,000	48,000
2	Pay inspectors, fleet paymasters	2	4,400	8,800			
11	Pay inspectors, after 20 years				11	4,000	44,000
3	Paymasters, fleet	3	4,400	13,200			
7	Paymasters, after 20 years	3	4,200	12,600	4	4,000	16,000
10	Paymasters, fourth 5 years	3	3,700	11,100	7	3,600	25,200
7	Paymasters, third 5 years	2	3,500	7,000	5	3,200	16,000
5	Paymasters, second 5 years	4	3,200	12,800	1	2,800	2,800
8	Paymasters, first 5 years	5	2,800	14,000	3	2,400	7,200
13	Passed assistant paymasters, after 5 years	7	2,200	15,400	6	2,000	12,000
7	Passed assistant paymasters, first 5 years	1	2,000	2,000	6	1,800	10,800
7	Assistant paymasters, first 5 years	6	1,700	10,200	1	1,400	1,400
3	Assistant paymasters, after 5 years	2	1,900	3,800	1	1,600	1,600
1	Chief engineer, chief of bureau				1	5,000	5,000
5	Chief engineers, fleet engineers	5	4,400	22,000			
20	Chief engineers, after 20 years	2	4,200	8,400	18	4,000	72,000
5	Chief engineers, fourth 5 years	3	3,700	11,100	2	3,600	7,200
6	Chief engineers, third 5 years	2	3,500	7,000	4	3,200	12,800
17	Chief engineers, second 5 years	8	3,200	25,600	9	2,800	25,200
16	Chief engineers, first 5 years	9	2,800	25,200	7	2,400	16,800
16	Passed assistant engineers, fourth 5 years	5	2,700	13,500	11	2,350	25,850
12	Passed assistant engineers, third 5 years	8	2,450	19,600	4	2,250	9,000
15	Passed assistant engineers, second 5 years	9	2,200	19,800	6	2,000	12,000
23	Passed assistant engineers, first 5 years	9	2,000	18,000	14	1,800	25,200
47	Assistant engineers, after 5 years	26	1,900	49,400	21	1,600	33,600
19	Chaplains, after 5 years	9	2,800	25,200	10	2,300	23,000
5	Chaplains, first 5 years	2	2,500	5,000	3	2,000	6,000
6	Professors of mathematics, after 15 years				6	3,500	21,000
6	Professors of mathematics, third 5 years				6	3,000	18,000
1	Chief constructor, chief of bureau				1	5,000	5,000
4	Naval constructors, fourth 5 years				4	4,000	16,000
4	Naval constructors, second 5 years				4	3,400	13,600
6	Naval constructors, first 5 years				6	3,200	19,200
11	Assistant naval constructors, after 8 years				11	2,600	28,600
5	Assistant naval constructors, after 4 years				5	2,200	11,000
5	Civil engineers, after 15 years				5	3,500	17,500
4	Civil engineers, third 3 years				4	3,000	12,000
1	Civil engineer, second 3 years				1	2,400	2,400
25	Boatswains, after 12 years, from date of appointment	10	1,800	18,000	15	1,600	24,000
4	Boatswains, third 3 years				4	1,300	5,200
4	Boatswains, second 3 years	3	1,300	3,900	1	1,000	1,000
34	Carpenters, after 12 years, from date of appointment	14	1,			1	[illegible]

Estimate of the amount required to pay the officers of the United States Navy—Continued.

ACTIVE LIST—Continued.

No.	Grade.	Sea duty.			Other duty.		
		No.	Pay per annum.	Total.	No.	Pay per annum.	Total.
1	Carpenter, fourth 3 years	1	$1,600	$1,600			
2	Carpenters, third 3 years	1	1,400	1,400	1	$1,300	$1,300
2	Carpenters, second 3 years	2	1,300	2,600			
2	Carpenters, first 3 years	1	1,200	1,200	1	900	900
23	Sailmakers, after 12 years	13	1,800	23,400	10	1,600	16,000
1	Sailmaker, third 3 years				1	1,300	1,300
22	Gunners, after 12 years	7	1,800	12,600	15	1,600	24,000
11	Gunners, third 3 years	4	1,400	5,600	7	1,300	9,100
6	Gunners, second 3 years	3	1,300	3,900	3	1,000	3,000
27	Mates	15	990	13,500	12	700	8,400
1494	Total	713		1,550,050	781		1,878,550

Total pay for 1,494 officers on the active list	$3,428,600
Pay for 292 naval cadets (under instruction at Naval Academy), at $500 per annum	146,000
Aggregate	3,574,600

RETIRED LIST.

Grade.	No.	Pay per annum.	Amount.
Rear-admirals	2	$6,000	$12,000
Do	30	4,500	135,000
Commodores	9	3,750	33,750
Do	1	2,625	2,625
Captains	8	3,375	27,000
Do	3	2,625	7,875
Do	1	2,250	2,250
Do	2	1,950	3,900
Commanders	10	2,625	26,250
Do	1	2,100	2,100
Do	2	1,400	2,800
Do	1	1,150	1,150
Lieutenant commanders	10	2,250	22,500
Do	9	2,100	18,900
Do	1	1,950	1,950
Do	1	1,500	1,500
Do	1	1,350	1,350
Do	2	1,100	2,200
Do	1	700	700
Lieutenants	25	1,950	48,750
Do	3	1,800	5,400
Do	2	1,200	2,400
Do	5	900	4,500
Lieutenants (junior grade)	9	1,500	13,500
Do	2	900	1,800
Do	1	700	700
Ensigns	11	1,050	11,550
Do	2	900	1,800
Do	2	600	1,200
Do	1	500	500
Do	1	300	300
Medical directors	2	3,750	7,500
Do	11	3,330	36,630
Do	1	3,150	3,150
Medical inspectors	7	3,330	23,310
Surgeons	3	2,625	7,875
Do	8	2,400	19,200
Do	1	2,100	2,100
Passed assistant surgeons	7	1,650	11,550
Do	1	1,100	1,100
Assistant surgeons	3	1,425	4,275
Do	3	1,275	3,825
Do	1	850	850
Pay directors	8	3,330	26,640
inspectors	3	3,330	9,990
[illegible]	4	3,150	12,600
	1	2,400	2,400
	1	1,400	1,400
paymaster	1	1,500	1,500
ater	1	1,425	1,425
	1	600	600

Estimate of the amount required to pay the officers of the United States Navy—**Continued.**

RETIRED LIST—Continued.

Grade.	No.	Pay per annum.	Amount.
Chief engineers	1	$3,750	$3,750
Do	16	3,300	52,800
Do	10	2,625	26,250
Do	1	2,400	2,400
Passed assistant engineers	4	2,025	8,100
Do	6	1,838	11,028
Do	16	1,650	26,400
Do	1	1,500	1,500
Do	4	1,275	5,100
Do	2	1,100	2,200
Do	1	850	850
Do	1	400	400
Assistant engineers	4	1,567	6,268
Do	16	1,425	22,800
Do	5	1,275	6,375
Do	1	950	950
Do	2	850	1,700
Do	1	600	600
Do	1	500	500
Chaplains	4	2,100	8,400
Professors of mathematics	4	2,625	10,500
Naval constructor	1	3,750	3,750
Do	1	3,375	3,375
Do	4	3,150	12,600
Civil engineer	1	3,250	3,250
Boatswains	15	1,350	20,250
Do	1	600	600
Gunners	23	1,350	31,050
Carpenters	14	1,350	18,900
Sailmakers	13	1,350	17,550
Do	1	500	500
Total	402		886,816

Number of clerks, and their pay, allowed to commandants of yards and stations, to paymasters of yards, to general storekeepers and on receiving ships and cruising vessels.

Number and designation.	Where employed.	Amount.
One first clerk to commandant	Navy-yard, Portsmouth, N. H	$1,500
One second clerk to commandant	do	1,200
One clerk to paymaster of yard	do	1,400
One principal clerk to general storekeeper	do	1,300
One first clerk to commandant	Navy-yard, Boston, Mass	1,500
One clerk to paymaster of yard	do	1,600
One principal clerk to general storekeeper	do	1,600
One clerk to paymaster of receiving ship	do	1,600
One first clerk to commandant	Navy-yard, New York, N. Y	1,500
One second clerk to commandant	do	1,200
One clerk to paymaster of yard	do	1,600
One principal clerk to general storekeeper	do	1,600
One clerk to paymaster of receiving ship	do	1,600
One first clerk to commandant	Navy-yard, League Island, Philadelphia, Pa.	1,500
One second clerk to commandant	do	1,200
One clerk to paymaster of yard	do	1,600
One principal clerk to general storekeeper	do	1,600
One clerk to paymaster of receiving ship	do	1,600
One first clerk to commandant	Navy-yard, Norfolk, Va	1,500
One second clerk to commandant	do	1,200
One clerk to paymaster of yard	do	1,400
One principal clerk to general storekeeper	do	1,[illegible]
One clerk to paymaster of receiving ship	[illegible]	1,
One first clerk to commandant	N	1
Two second clerks to commandant, at $1,200 each		2
One clerk to paymaster of yard		
One principal clerk to general storekeeper		
One clerk to paymaster of receiving ship		
One second clerk to commandant		
One clerk to paymaster of yard		
One first clerk to commandant		
One second clerk to commandant		
One clerk to paymaster of yard.		
One principal clerk to general st		

Number of clerks, and their pay, etc.—Continued.

Number and designation.	Where employed.	Amount.
One clerk to paymaster of receiving ship	Navy-yard, Mare Island, Cal	$1,800
One clerk to commandant	Naval station, New London, Conn	1,500
One clerk to paymaster of station	do	1,300
One clerk to commandant	Training Station, Newport, R. I	1,500
One clerk to paymaster of receiving ship	do	1,300
One clerk to general storekeeper	do	1,300
One clerk to paymaster of station	Torpedo Station, Newport, R. I	1,300
One clerk to superintendent	War College, Newport, R. I	1,500
One clerk to commandant	Naval Station, Key West, Fla	1,500
One clerk to paymaster of station	do	1,300
One clerk to commandant	Naval Academy, Annapolis, Md	1,500
One clerk to cadets storekeeper	do	1,300
One clerk to general storekeeper	do	1,300
One clerk to commissary	do	1,300
One clerk to paymaster of Academy	do	1,300
One clerk to paymaster of ships	do	1,300
One clerk to commanding officer	Naval Asylum, Philadelphia, Pa	1,500
One clerk to paymaster	do	1,300
One clerk to the general inspector, Pay Corps		1,300
One clerk to commandant	Naval station, Puget Sound, Washington.	1,500
One clerk to commandant	Naval station, Port Royal, S. C	1,500
One clerk to paymaster	do	1,300
One clerk to paymaster	Naval Proving Ground	1,300
Eight clerks to paymasters of flagships, at $1.100 each		8,800
Three clerks to paymasters of first-rate ships, at $1,300 each.*		3,900
Thirteen clerks to paymasters of second-rate ships, at $1,100 each.		14,300
Fourteen clerks to paymasters of third-rate ships, at $1,000 each.		14,000
Total		123,500

*Note.—Due to increase of Navy.

RECAPITULATION.

Total pay for 1,494 officers on the active list	$3,428,600
Total pay for 292 naval cadets	146,000
Total pay for 402 officers on the retired list	886,816
Total pay for 96 clerks	123,500
Total	4,584,916

PROPOSALS AND CONTRACTS.

Statement of proposals for furnishing nickel-steel armor plates received under the Department's advertisement of January 16, 1893.

Classes and exhibits.	Estimated weight.	Carnegie Steel Co., Limited, Pittsburg, Pa.				Bethlehem Iron Co., South Bethlehem, Pa.			
		Nickel steel.		Nickel steel, Harveyized.		Nickel steel.		Nickel steel, Harveyized.	
		Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.
Class A. Exhibit 1.									
	Tons.								
For two 13-inch turrets Twelve turret plates	287.36	$585.00	$168,105.60	$641.00	$184,197.76	*$575.00	$165,232.00	$631.00	$181,324.16
Eight turret tops	64.00	585.00	37,440.00	685.80	43,891.20	575.00	36,800.00	675.80	43,251.20
Two sight hoods	6.25	585.00	3,656.25	685.80	4,286.25	575.00	3,593.75	675.80	4,223.75
Two tops of hoods	.60	585.00	351.00	685.80	411.48	575.00	345.00	675.80	405.48
Appurtenances:									
Bolts	6.07	650.00	3,949.50	....	3,949.50	*650.00	3,945.50	650.00	3,945.50
Tap bolts for top plating	.95	650.00	617.50	....	617.50	650.00	617.50	650.00	617.50
Cups	1.54	650.00	1,001.00	....	1,001.00	650.00	1,001.00	650.00	1,001.00
Washers	.79	650.00	513.50	....	513.50	650.00	513.50	650.00	513.50
Total price Class A. Exhibit 1			215,630.35	....	238,864.19	....	212,048.25	....	235,282.09
Class A. Exhibit 2.									
Sixteen turret plates, 8 inch B. L. R	97.00	*575.00	55,775.00	664.60	64,466.20	587.50	56,987.50	677.10	65,678.70
Eight tops of turrets	32.48	575.00	18,676.00	675.80	21,949.98	587.50	19,082.00	688.30	22,355.98
Eight sight hoods	10.00	575.00	5,750.00	675.80	6,758.00	587.50	5,875.00	688.30	6,883.00
Eight tops of hoods	2.08	575.00	1,196.00	675.80	1,405.66	587.50	1,222.00	688.30	1,431.66
Appurtenances:									
Bolts	.50	650.00	325.00	....	325.00	650.00	325.00	650.00	325.00
Tap bolts for top plating	.51	650.00	331.50	....	331.50	650.00	331.50	650.00	331.50
Cups	.07	650.00	45.50	....	45.50	650.00	45.50	650.00	45.50
Washers	.03	650.00	19.50	....	19.50	650.00	19.50	650.00	19.50
Wrought-iron tubes, split	.06	650.00	39.00	....	39.00	650.00	39.00	650.00	39.00
Total price Class A. Exhibit 2			82,157.50	....	95,340.34	....	83,927.00	....	97,189.84
Class A. Exhibit 3.									
For two 13-inch turrets Twelve turret plates	287.36	585.00	168,105.60	641.00	184,197.76	*575.00	165,232.00	631.00	181,324.16
Eight turret tops	64.00	585.00	37,440.00	685.80	43,891.20	575.00	36,800.00	675.80	43,251.20
Two sight hoods	6.25	585.00	3,656.00	685.80	4,286.25	575.00	3,593.75	675.80	4,223.75
Two tops of hoods	.60	585.00	351.00	685.80	411.48	575.00	345.00	675.80	405.48

Appurtenances:									
Bolts	6.07	650.00	3,945.50	....	3,945.50	*650.00	3,945.50	650.00	3,945.50
Tap bolts for top plating	.95	650.00	617.50	....	617.50	650.00	617.50	650.00	617.50
Cups	1.54	650.00	1,001.00	....	1,001.00	650.00	1,001.00	650.00	1,001.00
Washers	.79	650.00	513.50	....	513.50	650.00	513.50	650.00	513.50
Total price Class A, Exhibit 3			215,630.35		238,864.19	....	212,048.25	....	235,282.09
Class A. Exhibit 4.									
Sixteen turret plates, 8-inch B. L. R	97.00	575.00	55,775.00	664.60	64,446.20	587.50	56,987.50	677.10	65,678.70
Eight tops of turrets	32.48	575.00	18,676.00	675.80	21,494.95	587.50	19,082.00	688.30	22,355.98
Eight sight hoods	10.00	575.00	5,750.00	675.80	6,758.00	587.50	5,875.00	688.30	6,883.00
Eight tops of hoods	2.08	575.00	1,196.00	675.80	1,405.66	587.50	1,222.00	688.30	1,431.66
Appurtenances:									
Bolts	.50	*650.00	325.00	....	325.00	650.00	325.00	650.00	325.00
Tap bolts for top plating	.51	650.00	331.50	....	331.50	650.00	331.50	650.00	331.50
Cups	.07	650.00	45.50	....	45.50	650.00	45.50	650.00	45.50
Washers	.03	650.00	19.50	....	19.50	650.00	19.50	650.00	19.50
Wrought-iron tubes, split	.06	650.00	39.00	....	39.00	650.00	39.00	650.00	39.00
Total price Class A, Exhibit 4			82,157.50	....	95,360.34	....	83,927.00	....	97,109.84
Class A. Exhibit 5.									
For two 13-inch turrets, Twelve turret plates	287.36	585.00	168,105.60	641.00	184,197.76	*575.00	165,232.00	631.00	181,324.16
Eight turret tops	64.00	585.00	37,440.00	685.80	43,891.20	575.00	36,800.00	675.80	43,251.20
Two sight hoods	6.25	585.00	3,656.25	685.80	4,286.25	575.00	3,593.75	675.80	4,223.75
Two tops of hoods	.60	585.00	351.00	685.80	411.48	575.00	345.00	675.80	405.48
Appurtenances:									
Bolts	6.07	650.00	3,945.50	....	3,945.50	*650.00	3,945.50	650.00	3,945.50
Tap bolts for top plates	.95	650.00	617.50	....	617.50	650.00	617.50	650.00	617.50
Cups	1.54	650.00	1,001.00	....	1,001.00	650.00	1,001.00	650.00	1,001.00
Washers	.79	650.00	513.50	....	513.59	650.00	513.50	650.00	513.50
Total price Class A, Exhibit 5			215,680.35	....	238,864.19	....	212,048.25	....	235,282.09
Class A. Exhibit 6.									
Sixteen turret plates, 8-inch B. L. R	97.00	575.00	55,775.00	664.60	64,466.20	587.50	56,987.50	677.10	65,678.70
Eight tops of turrets	32.48	575.00	18,676.00	675.80	21,949.98	587.50	19,082.00	688.30	22,355.98
Eight sight hoods	10.00	575.00	5,750.00	675.80	6,758.00	587.50	5,875.00	688.30	6,883.00
Eight tops of hoods	2.08	575.00	1,196.00	675.80	1,405.66	587.50	1,222.00	688.30	1,431.66
Appurtenances:									
Bolts	.50	*650.00	325.00	....	325.00	650.00	325.00	650.00	325.00
Tap bolts for top plating	.51	650.00	331.50	....	331.50	650.00	331.50	650.00	331.50
Cups	.07	650.00	45.50	....	45.50	650.00	45.50	650.00	45.50

* Contracts awarded.

Statement of proposals for furnishing nickel-steel armor plate received under the Department's advertisement of January 16, 1893—Continued.

Classes and exhibits.	Estimated weight.	Carnegie Steel Co., Limited, Pittsburg, Pa.				Bethlehem Iron Co., South Bethlehem, Pa.			
		Nickel steel.		Nickel steel, Harveyized.		Nickel steel.		Nickel steel Harveyized.	
		Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.
Class A. Exhibit 6—Continued.									
Appurtenances—Continued.	*Tons.*								
Washers	.03	$650.00	$19.50	....	$19.50	$650.00	$19.50	$650.00	$19.50
Wrought iron tubes, split	.06	650.00	39.00	....	39.00	650.00	39.00	650.00	39.00
Total price Class A, Exhibit 6	....	....	82,157.50	....	95,340.34	....	83,927.00	....	97,109.84
Class A. Exhibit 7.									
Fourteen turret plates, 8 inch B. L. R.	490.00	590.00	289,100.00	$646.00	316,540.00	*575.00	281,750.00	631.00	309,190.00
Eight tops of turrets	45.00	590.00	26,550.00	690.80	31,086.00	575.00	25,875.00	675.80	30,411.00
Four sight hoods	9.00	590.00	5,310.00	690.80	6,217.20	575.00	5,175.00	675.80	6,082.20
Four tops of hoods	1.50	590.00	885.00	690.80	1,036.20	575.00	862.50	675.80	1,013.70
Appurtenances:									
	8.44	650.00	5,486.00	....	5,486.00	*650.00	5,486.00	650.00	5,486.00
top plating	.95	650.00	617.50	....	617.50	650.00	617.50	650.00	617.50
	2.25	650.00	1,462.50	....	1,462.50	650.00	1,462.50	650.00	1,462.50
	1.15	650.00	747.50	....	747.50	650.00	747.50	650.00	747.50
ass A, Exhibit 7	....	....	330,158.50	....	363,192.90	....	321,976.00	....	355,010.40
Class A, Exhibit 8.									
lates, 8-inch B. L. R.	98.00	*675.00	56,350.00	664.60	65,130.80	587.50	57,575.00	677.10	66,355.80
turrets	25.00	675.00	14,375.00	675.80	16,895.00	587.50	14,687.50	688.30	17,207.50
hoods.	10.50	675.00	6,037.50	675.80	7,095.90	587.50	6,168.75	688.30	7,227.15
hoods	2.00	675.00	1,150.00	675.80	1,351.60	587.50	1,175.00	688.30	1,376.60
	.51	*650.00	331.50	....	331.50	650.00	331.50	650.00	331.50
plating	.52	650.00	338.00	....	338.00	650.00	338.00	650.00	338.00
	.08	650.00	52.00	....	52.00	650.00	52.00	650.00	52.00
	.04	650.00	26.00	....	26.00	650.00	26.00	650.00	26.00
es, split	.07	650.00	45.50	....	45.50	650.00	45.50	650.00	45.50
ss A, Exhibit 8	....	....	78,705.50	....	91,266.30	....	80,399.25	....	92,960.05
Class A, Exhibit 9.									
plates, 8-inch B. L. R.	92.00	*575.00	52,900.00	664.60	61,143.20	587.50	54,050.00	677.10	62,293.20
ops of turrets	33.50	575.00	19,262.50	675.80	22,639.30	587.50	19,681.25	688.30	23,058.05

Eight sight hoods	10.00	575.00	5,750.00	675.80	6,758.00	587.50	5,875.00	688.30	6,883.00
Eight tops of hoods	2.50	575.00	1,437.50	675.80	1,689.50	587.50	1,468.75	688.30	1,720.75
Appurtenances:									
Bolts	.51	*650.00	331.50	....	331.50	650.00	331.50	650.00	331.50
Tap bolts in top plating	.52	650.00	338.00	....	338.00	650.00	338.00	650.00	338.00
Cups	.08	650.00	52.00	....	52.00	650.00	52.00	650.00	52.00
Washers	.04	650.00	26.00	....	26.00	650.00	26.00	650.00	26.00
Wrought-iron tubes, split	.07	650.00	45.50	....	45.50	650.00	45.50	650.00	45.50
Total price Class A, Exhibit 9	....	....	80,143.00	....	93,023.00	....	81,868.00	....	94,748.00
Class A, Exhibit 10.									
Six turret plates	28.24	*575.00	16,238.00	687.00	19,400.88	587.50	16,591.00	699.50	19,753.88
Four tops of turrets	9.94	575.00	5,715.50	675.80	6,717.45	587.50	5,839.75	688.30	6,841.70
Four sight hoods	4.00	575.00	2,300.00	675.80	2,703.20	587.50	2,350.00	688.30	2,753.20
Four tops of hoods	.46	575.00	264.50	675.80	310.87	587.50	270.25	688.30	316.62
Appurtenances									
Bolts	.25	*650.00	162.50	....	162.50	650.00	162.50	650.00	162.50
Tap bolts in top plating	.30	650.00	195.00	....	195.00	650.00	195.00	650.00	195.00
Cups	.04	650.00	26.00	....	26.00	650.00	26.00	650.00	26.00
Washers	.02	650.00	13.00	....	13.00	650.00	13.00	650.00	13.00
Wrought-iron tubes, split	.03	650.00	19.50	....	19.50	650.00	19.50	650.00	19.50
Total price Class A, Exhibit 10	....	....	24,934.00	....	29,548.40	....	25,467.05	....	30,081.40
Class B, Exhibit 1.									
Twenty-six barbette plates, 13-inch B. L. R	774.80	589.00	456,357.20	645.00	499,746.00	*575.00	445,510.00	631.00	488,898.80
Appurtenances:									
Bolts	13.88	650.00	9,022.00	....	9,022.00	650.00	9,022.00	650.00	9,022.00
Cups	3.43	650.00	2,229.50	....	2,229.50	650.00	2,229.50	650.00	2,229.50
Washers	1.74	650.00	1,131.00	....	1,131.00	650.00	1,131.00	650.00	1,131.00
Total price Class B, Exhibit 1	....	....	468,739.70	....	512,128.50	....	457,892.50	....	501,281.30
Class B, Exhibit 2.									
Twelve barbette plates, 8-inch B. L. R	153.68	*575.00	88,366.00	653.40	100,414.51	580.00	89,134.40	658.40	101,182.91
Appurtenances:									
Bolts	1.75	650.00	1,137.50	....	1,137.50	650.00	1,137.50	650.00	1,137.50
Cups	.56	650.00	364.00	....	364.00	650.00	364.00	650.00	364.00
Washers	.23	650.00	149.50	....	149.50	650.00	149.50	650.00	149.50
Total price Class B, Exhibit 2	....	....	90,017.00	....	102,065.51	....	90,785.40	....	102,833.91
Class B, Exhibit 3.									
Fifteen barbette plates, 12 inch B. L. R	521.00	*575.00	299,575.00	631.00	328,751.00	580.00	302,180.00	636.00	331,356.00

* Contract awarded.

Statement of proposals for furnishing nickel-steel armor plates received under the Department's advertisement of January 16, 1893—Continued.

Classes and exhibits.	Estimated weight.	Carnegie Steel Co., Limited, Pittsburg, Pa.				Bethlehem Iron Co., South Bethlehem, Pa.			
		Nickel steel.		Nickel steel Harveyized		Nickel steel.		Nickel steel Harveyized.	
		Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.
Class B, Exhibit 3—Continued.									
Appurtenances:	*Tons.*								
Bolts	10.22	$650.00	$6,643.00	....	$6,643.00	$650.00	$6,643.00	$650.00	$6,643.00
Cups	2.31	650.00	1,501.50	....	1,501.50	650.00	1,501.50	650.00	1,501.50
Washers	1.19	650.00	773.50	....	773.50	650.00	773.50	650.00	773.50
Cast-steel sleeves	8.16	325.00	2,652.00	....	2,652.00	325.00	2,652.00	325.00	2,652.00
Total price Class B, Exhibit 3			311,145.00		340,321.00		313,750.00		342,926.00
Class B, Exhibit 4.									
welve barbette plates, 8-inch B. L. R	148.40	575.00	85,330.00	$653.40	96,964.56	580.00	86,072.00	658.40	97,706.56
urtenances:									
Bolts	1.59	$650.00	1,033.50	....	1,033.50	650.00	1,033.50	650.00	1,033.50
ps	.54	650.00	351.00	....	351.00	650.00	351.00	650.00	351.00
ashers	.23	650.00	149.50	....	149.50	650.00	149.50	650.00	149.50
Total price Class B, Exhibit 4			86,864.00		98,498.56		87,606.00		99,240.56
***Class** B, Exhibit 5.*									
, 8-inch B. L. R	145.00	575.00	83,375.00	653.40	94,743.00	580.00	84,100.00	638.40	95,468.00
	1.59	650.00	1,033.50	....	1,033.50	650.00	1,033.50	650.00	1,033.50
	.54	650.00	351.00	....	351.00	650.00	351.00	650.00	351.00
	.23	650.00	149.50	....	149.50	650.00	149.50	650.00	149.50
B, Exhibit 5			84,909.00		96,277.00		85,634.00		97,002.00
***Class** C, Exhibit 1.*									
18 inches	613.56	540.00	331,322.40	596.00	365,681.76	520.00	319,051.20	576.00	353,410.56
	14.77	650.00	9,600.50	....	9,600.50	650.00	9,600.50	650.00	9,600.50
	2.97	650.00	1,930.50	....	1,930.50	650.00	1,930.50	650.00	1,930.50
	4.60	650.00	2,990.00	....	2,990.00	650.00	2,990.00	650.00	2,990.00
	1.87	650.00	1,215.50	....	1,215.50	650.00	1,215.50	650.00	1,215.50
	3.03	325.00	984.75	....	984.75	335.00	984.75	325.00	984.75

Cast steel sleeves	4.86	325.00	1,579.50	....	1,579.50	325.00	1,579.50	325.00	1,579.50
Total price Class C, Exhibit 1	....	....	349,623.15	....	383,982.51	....	337,351.95	....	371,711.31
Class C, Exhibit 2.									
Twenty side armor plates, 14 inches	630.60	*515.00	324,750.00	571.00	360,072.60	525.00	331,065.00	581.00	366,378.60
Appurtenances:									
Bolts	8.69	650.00	5,648.50	....	5,648.50	650.00	5,648.50	650.00	5,648.50
Nuts	2.56	650.00	1,664.00	....	1,664.00	650.00	1,664.50	650.00	1,664.00
Cups	2.00	650.00	1,300.00	....	1,300.00	650.00	1,300.00	650.00	1,300.00
Washers	1.12	650.00	728.00	....	728.00	650.00	728.00	650.00	728.00
Wrought-iron tubes	1.78	325.00	578.50	....	578.50	325.00	578.50	325.00	578.50
Cast-steel sleeves	3.22	325.00	1,046.50	....	1,046.50	325.00	1,046.50	325.00	1,046.50
Total price Class C, Exhibit 2	....	....	335,724.50	....	371,038.10	....	342,030.50	....	377,344.10
Class C, Exhibit 3.									
Ten diagonal armor plates, 12 inches	234.70	545.00	127,911.50	601.00	141,054.70	*525.00	123,217.50	581.00	136,360.70
Appurtenances:									
Bolts	3.55	650.00	2,307.50	....	2,307.50	*650.00	2,307.50	650.00	2,307.50
Nuts	1.04	650.00	676.00	....	676.00	650.00	676.00	650.00	676.00
Cups	.90	650.00	585.00	....	585.00	650.00	585.00	650.00	585.00
Washers	.45	650.00	292.50	....	292.50	650.00	292.50	650.00	292.50
Wrought iron tubes	.71	325.00	230.75	....	230.75	325.00	230.75	325.00	230.75
Cast-steel sleeves	1.39	325.00	451.75	....	451.75	325.00	451.75	325.00	451.75
Total price Class C, Exhibit 3	....	....	132,455.00	....	145,598.20	....	127,761.00	....	140,904.20
Class C, Exhibit 4.									
Twenty-eight side armor plates	155.00	*515.00	79,825.00	615.80	95,449.00	525.00	81,375.00	625.80	96,999.00
Appurtenances:									
Bolts	1.54	*650.00	1,001.00	....	1,001.00	650.00	1,001.00	650.00	1,001.00
Nuts	....	....	....	....	....	....	....	....	....
Cups	.19	650.00	123.00	....	123.50	650.00	123.50	650.00	123.50
Washers	.14	650.00	91.00	....	91.00	650.00	91.00	650.00	91.00
Wrought-iron tubes, split	.17	650.00	110.50	....	110.50	650.00	110.50	650.00	110.50
Total price Class C, Exhibit 4	....	....	81,151.00	....	96,775.00	....	82,701.00	....	98,325.00
Class D, Exhibit 1.									
Four sponson plates, 4 inches	18.00	*725.00	13,050.00	837.00	15,066.00	775.00	13,950.00	887.00	15,966.00
Two sponson plates, 6 pounder	3.50	725.00	2,537.50	837.00	2,929.50	775.00	2,712.50	887.00	3,104.50
Twelve sponson plates, 5 inches	66.00	725.00	47,850.00	837.00	55,242.00	775.00	51,150.00	887.00	58,542.00
Twelve sponson plates, 6-pounder	14.00	725.00	10,150.00	837.00	11,718.00	775.00	10,850.00	887.00	12,418.00
Total price Class D, Exhibit 1	....	....	73,587.50	....	84,955.50	....	78,662.50	....	90,030.50

*Contract awarded.

Statement of proposals for furnishing nickel-steel armor plates received under the Department's advertisement of January 16, 1893—Continued.

Classes and exhibits.	Estimated weight.	Carnegie Steel Co., Limited, Pittsburg, Pa.				Bethlehem Iron Co., South Bethlehem, Pa.			
		Nickel steel.		Nickel steel Harveyized.		Nickel steel.		Nickel steel Harveyized.	
		Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.	Per ton.	Aggregate.
Class E, Exhibit 1.	Tons.								
Eighteen casemate armor plates	116.80	*$525.00	$61,320.00	$637.00	$74,401.60	$540.00	$63,072.00	$652.00	$76,153.60
Twelve casemate armor plates	86.60	525.00	45,465.00	637.00	55,164.20	540.00	46,764.00	652.00	56,463.20
Appurtenances:									
Bolts	1.08	*650.00	702.00		702.00	650.00	702.00	650.00	702.00
Cups	.19	650.00	123.50		123.50	650.00	123.50	650.00	123.50
Washers	.13	650.00	84.50		84.50	650.00	84.50	650.00	84.50
Wrought-iron tubes, split	.15	650.00	97.50		97.50	650.00	97.50	650.00	97.50
Total price Class E, Exhibit 1			107,792.50		130,573.30		110,843.50		133,624.30
Class E, Exhibit 2.									
Eight bulkhead plates	14.50	*500.00	7,250.00	612.00	8,874.00	515.00	7,467.50	627.00	9,091.50
Twenty-four bulkhead plates	55.00	500.00	27,500.00	612.00	33,660.00	515.00	28,325.00	627.00	34,485.00
Total price Class E, Exhibit 2			34,750.00		42,534.00		35,792.50		43,576.50
Class F, Exhibit 1.									
One conning tower	27.80	590.00	16,402.00			*575.00	15,985.00		
One conning tower shield	9.50	590.00	5,605.00			575.00	5,462.50		
One conning tower top	1.50	590.00	885.00			575.00	862.50		
One conning tower shield hood	1.50	590.00	885.00			575.00	862.50		
One conning tower tube	14.50	590.00	8,555.00			575.00	8,337.50		
Appurtenances, tap bolts	0.36	650.00	234.00			650.00	234.00		
Total price Class F, Exhibit 1			32,566.00				31,744.00		
Class F, Exhibit 2.									
One conning tower	20.00	590.00	11,800.00			*575.00	11,500.00		
One conning tower shield	5.50	590.00	3,245.00			575.00	3,162.50		
One conning tower top	1.50	590.00	885.00			575.00	862.50		
One conning tower shield hood	1.00	590.00	590.00			575.00	575.00		
One conning tower tube	13.00	590.00	7,670.00			575.00	7,475.00		

Appurtenances, tap bolts	.36	650.00	234.00			*650.00	234.00		
Total price Class F, Exhibit 2			24,424.00				23,809.00		
Class F, Exhibit 3.									
Four tubes	50.00	650.00	32,500.00			*600.00	30,000.00		
Four tubes	72.50	650.00	47,125.00			600.00	43,500.00		
Total price Class F, Exhibit 3			79,625.00				73,500.00		

* Contract awarded.

Statement of proposals for the design of a submarine torpedo boat, received under the Department's advertisement of May 1, 1893.

No.	Name and address of bidder.	Price.
1	Simon Lake, Baltimore, Md	None.
2	Clarence B. Schultz, Philadelphia, Pa	6 per cent contract price.
3	John Ambrose, Youngstown, Ohio	None.
4	Albert Bosshoerd, Philadelphia, Pa	None.
5	O. Brubaker, Allegheny, Pa	None.
6	John R. Forbes, Jersey City, N. J	None.
7	R. G. Northum, Stephens, Ark	None.

Statement of proposals for the construction of a submarine torpedo boat, received under the Department's advertisement of May 1, 1893.

No.	Name and address of bidder.	Price.	Time for construction.
1	George C. Baker, Washington, D. C	$150,000	9 months.
*2	do	130,000	9 months.
3	John P. Holland Torpedo Boat Co., New York, N. Y	150,000	12 months.
*4	Marcus Ruthenburg, Philadelphia, Pa	175,000	18 months.
5	Cowles Engineering Co., Brooklyn, N. Y	120,000	12 months.

* Informal.

Statement of proposals received and opened December 15, 1892, under advertisement dated September 28, 1892, for the construction of a seagoing battle ship of about 9,000 tons displacement (seagoing battle ship No. 1), authorized by act of July 19, 1892.

Class I.—For the construction of the hull and machinery, including engines, boilers and appurtenances, and equipment, except anchors and chains, complete in all respects, in accordance with the drawings, plans, and specifications provided by the Secretary of the Navy:

Newport News Ship Building and Dry Dock Company, Newport News, Va	$3,233,000
Union Iron Works, San Francisco, Cal	3,150,000
Bath Iron Works, Bath, Me	3,185,000
William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa	* 3,010,000

Class II.—For the construction of the hull and machinery, including engines, boilers and appurtenances, and equipment, except anchors and chains, complete in all respects, in accordance with the drawings, plans, and specifications provided by the bidder:

William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa	a$3,110,000
William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa	b2,870,000

Statement of proposals received and opened December 15, 1892, under advertisement dated September 28, 1892, for the construction of an armored cruiser of about 8,000 tons displacement (armored cruiser No. 3), authorized by act of July 19, 1892.

Class I.—For the construction of the hull and machinery, including engines, boilers and appurtenances, and equipment, except anchors and chains, complete in all respects, in accordance with the drawings, plans, and specifications provided by the Secretary of the Navy:

Newport News Ship Building and Dry Dock Company, Newport News, Va	$3,147,000
Union Iron Works, San Francisco, Cal	3,050,000
William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa	* 2,986,000

* Contract awarded.

Class II.—For the construction of the hull and machinery, including engines, boilers and appurtenances, and equipment, except anchors and chains, complete in all respects, in accordance with the drawings, plans, and specifications provided by the bidder:

Bath Iron Works, Bath, Me	$3,165,000
William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa	*a* 3,086,000
William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa	*b* 2,880,000

Schedule of bids and statement of contracts awarded and entered into to furnish stationery for the Navy Department and the bureaus and offices thereof, for the fiscal year ending June 30, 1894.

Name and address of bidder.	Class 1.	Class 2.	Class 3.	Class 4.	Class 5.	Class 6.	Class 7.
James J. Chapman, Washington, D. C.	$469.80	$469.92	$131.54	$131.55	....	....	....
Wm. Ballantyne & Sons, Washington, D. C	471.25	471.92	132.10	127.90	....	....	....
John C. Parker, Washington, D. C	....	....	....	....	....	....	$395.00
Sheffield Manufacturing Co., Saugerties, N. Y	371.97	*341.93	*122.24	*123.74	....	*$293.55	....
Manhattan Supply Co., New York, N. Y	467.05	482.56	134.53	131.83	$561.39	600.45	312.40
Excelsior Typewriter Ribbon Co., New York, N. Y	....	....	....	....	....	....	242.08
Tissot & Schultz, New York, N. Y	....	....	....	....	....	....	*169.75
Wycoff, Seamans & Benedict, Washington, D. C	....	....	....	....	....	541.65	284.00
W. H. Teepe, Washington, D. C	*315.04	....	....	132.11	....	615.34	241.58
Easton & Rupp, Washington, D. C	461.14	491.82	133.86	132.64	*476.01	482.06	395.00

Name and address of bidder	Class 8.	Class 9.	Class 10.	Class 11.	Class 12.	Class 13.	Class 14.
Wm. Ballantyne & Sons, Washington, D. C	$196.51	*$37.09	$31.41	$52.20	$174.57	....	....
Manhattan Supply Co., New York, N. Y	*160.95	55.30	42.10	91.10	176.62	$273.98	$564.12
Tissot & Schultz, New York, N. Y	....	41.31	44.65	99.36	....	*241.96	....
Columbia Rubber Works Co., New York, N. Y	....	....	....	....	*142.03	....	....
W. H. Teepe, Washington, D. C	....	....	....	*44.44	....	....	....
Easton & Rupp, Washington, D. C	193.28	40.79	*31.03	52.08	178.65	292.70	....

Name and address of bidder.	Class 15.	Class 16.	Class 17.	Class 18.	Class 19.	Class 20.	Class 21.
Wm. Ballantyne & Sons, Washington, D. C	....	....	....	....	$101.49	$71.01	$53.74
John C. Parker, Washington, D. C	....	....	....	....	116.35	....	....
Manhattan Supply Co., New York, N. Y	$131.75	$83.70	$117.72	....	116.61	76.73	56.79
Tissot & Schultz, New York, N. Y	....	83.53	167.47	....	117.87	71.41	52.64
W. H. Teepe, Washington, D. C	....	....	*109.97	....	....	....	*48.16
Easton & Rupp, Washington, D. C	*111.81	*68.27	....	....	107.88	*69.52	49.84
Remsburg & Elliott, Washington, D. C	....	....	....	*$378.19	....	....	....

* Contract awarded.

Statement of proposals for the purchase of waste paper of the Navy Department and its several bureaus and offices during the fiscal year ending June 30, 1894, received under the Department's advertisement of June 12, 1893.

No.	Name and address of bidder.	Price per 100 pounds.
		Cents.
1	J. Dreifus & Co., Washington, D. C	35
2	E. G. Wheeler, for Mrs. S. A. Wheeler, Washington, D. C	*42½

* Contract awarded.

Schedule of bids and statement of contracts awarded and entered into for furnishing ice and washing towels for the Navy Department and its bureaus and offices during the fiscal year ending June 30, 1894.

ICE.

[Date of advertisement, May 16, 1893.]

No.	Bidder.	Price per 100 pounds.
		Cents.
1	Great Falls Ice Co	34½
2	Hygienic Ice Co	35½
3	The National Capital Ice Co.	36
4	The Independent Ice Co	34

All of the above proposals were rejected as being excessive, and the Department readvertised for proposals June 6, 1893.

[Date of advertisement, June 6, 1893.]

No.	Bidder.	Price per 100 pounds.
		Cents.
1	Independent Ice Co	34 *25
2	Great Falls Ice Co	34½
3	National Capital Ice Co	36
4	Hygienic Ice Co	35½
5	American Ice Co	35
6	Transparent Ice Co	36

* At wharf.

In addition to the proposals in the above schedule the Department received an informal offer from the Fairmount Ice Manufacturing Company, of Philadelphia, Pa., to furnish the ice required for 20 cents for 100 pounds. While the offer of this company was under consideration the Independent Ice Company, of Washington, D. C., submitted a modified proposal at 28 cents per 100 pounds, and the Fairmount Ice Manufacturing Company being unable to commence the delivery of ice by the commencement of the fiscal year the modified proposal of the Independent Ice Company was accepted and a contract entered into with that company accordingly.

WASHING TOWELS.

No.	Name and address of bidder.	Price per 100.
		Cents.
1	James W. Cotton, Washington, D. C	*75

* Contract r

SALE OF CONDEMNED VESSELS.

Since the date of the last annual report of this Department only two condemned vessels have been offered for sale, the *Palos*, on the Asiatic station and the *Phlox* at Annapolis. The *Palos* was appraised at $7,000 and proposals invited by public advertisement for her purchase at not less than her appraised value. The highest bid received was 6,000 silver yen which, at the legal value of the yen, was less than the sum at which she was appraised. Under authority of the President the commanding officer on the Asiatic station was cabled on the 6th January last to accept the highest offer. He succeeded in obtaining an offer of 7,000 silver yen, which he accepted. After deducting all expenses connected with the sale, the net proceeds, amounting to $5,145.10, were deposited by the pay officer having it in charge, in the Treasury, and covered in in accordance with section 3618 of the Revised Statutes, as "miscellaneous receipts on account of proceeds of public property."

On the 17th of June last, the tug *Phlox*, at Annapolis, appraised at $2,000, was advertised for sale, but no offers were received.

The following copy of the return made to the accounting officers of the Treasury shows the expense of advertising and to whom paid, for proposals for the purchase of the tugs *Ivy* and the *Mayflower*, and the disposition of the money received from the sale of the former vessel. The net proceeds were, as will be seen, covered into the Treasury February 23, 1893, in accordance with section 3681 of the Revised Statutes, as "miscellaneous receipts on account of proceeds of public property."

Very respectfully,

Jno. W. Hogg,
Chief Clerk.

The Secretary of the Navy.
October 26, 1893.

B. F. Tracy, Secretary of the Navy, in account with the United States for proceeds of sale of United States tug Ivy, under public advertisement of October 20, 1892, inviting written proposals, and in pursuance of the fifth section of the act of Congress approved March 3, 1883.

Dr.

November 26, 1892. To deposit accompanying the following accepted bid: George Johnson	$1,305.00

Cr.

By amount paid for advertising as follows:	
December 12, 1892. Landmark, Norfolk, No. 1	14.85
December 20, 1892. Mail and Express, New York, No. 2	61.20
December 20, 1892. Inquirer, Philadelphia, No. 3	44.80
December 20, 1892. Chronicle, Vallejo, Cal., No. 4	15.55
December 20, 1892. Morning Call, San Francisco, No. 5	30.25
February 23, 1893. By amount covered into the United States Treasury as miscellaneous receipts	1,138.35
	1,305.00

Navy Department,
February 23, 1893.

B. F. Tracy,
Secretary of the Navy.

RECEIPTS FROM SALE OF GOVERNMENT PROPERTY.

Statement of deposits on account of sales of Government property, Navy Department, from November 1, 1892, to November 1, 1893.

[Compiled in Fourth Auditor's Office, by direction of the Secretary of the Treasury.]

Date of deposit.	Place of deposit.	By whom deposited.	Nature of property sold.	Amount covered to miscellaneous receipts.	Amount credited to the appropriation.	Total amount deposited.	Remarks.
1892.							
Nov. 2	New York	John Furey, paymaster, U. S. Navy	Clothing sold to Naval Reserve		$447.59	$447.59	
3	United States Treasury	H. B. Lowry, quartermaster, U. S. Marine Corps.	Condemned marine clothing	$5.52		5.52	
9	New York	John Furey, paymaster, U. S. Navy.	Clothing sold to revenue steamer Fessenden.		273.00	273.00	
12	do	do	Clothing sold to revenue steamer Winona.		8.10	8.10	
15	United States Treasury	H. B. Lowry, quartermaster, U. S. Marine Corps.	Fuel sold to officers		46.13	46.13	
15	do	do	Condemned clothing and furniture.	43.19		43.19	
21	New York	John Furey, paymaster, U. S. Navy	Sale of canvas hats		262.50	262.50	
Dec. 2	do	do	Clothing sold to the St. Marys		679.73	679.73	
19	United States Treasury	L. C. Kerr, passed assistant paymaster, U. S. Navy.	Gain on exchange	96.38		96.38	
9	do	O. C. Tiffany, paymaster, U. S. Navy	do	1,228.72		1,228.72	
	do	T. J. Cowie, passed assistant paymaster, U. S. Navy.	do	491.21		491.21	
	do	L. A. Frailey, paymaster, U. S. Navy	do	1,370.71		1,370.71	
	do	T. S. Thompson, paymaster, U. S. Navy.	Sale of devices and shields	.30		.30	
	do	R. T. M. Ball, passed assistant paymaster, U. S. Navy.	Gain on exchange	400.27		400.27	
	do	Seligman Brothers	Interest on daily balances	492.73		492.73	
	Newport, R. I.	C. S. Williams, passed assistant paymaster, U. S. Navy.	Received from Dundee Chemical Works on account of acid drums.	48.29		48.29	
	ited States Treasury	C. M. Ray, passed assistant paymaster, U. S. Navy.	Ground rent at Yokohama	182.47		182.47	
	do	H. G. Colby, paymaster, U. S. Navy.	Gain on exchange	887.13		887.13	
	do	O. C. Tiffany, paymaster, U. S. Navy.	do	1,064.98		1,064.98	
	ton	C. A. McDaniel, paymaster, U. S. Navy.	Dock charges, steamer Brittania	1,292.42		1,292.42	
	nited States Treasury	T. A. Cowie, passed assistant paymaster, U. S. Navy.	Gain on exchange	177.16		177.16	
	do	H. B. Lowry, quartermaster, U. S. Marine Corps.	Condemned stores	12.90		12.90	
	do	Secretary of the Navy	Sale of tug Ivy	1,138.35		1,138.35	

	......do	J. E. Cann, paymaster, U. S. Navy	Gain on exchange	45.00	....	45.00	
	......do	J. A. Mudd, passed assistant paymaster, U. S. Navy.	......do	9.13	....	9.13	
15	......do	Seligman Brothers	Interest on daily balances and gain on exchange.	1 736.36	....	1,736.36	
24	......do	H. B. Lowry, quartermaster, U. S. Marine Corps.	Fuel sold to officers		433.53	433.53	
27	......do	G. C. Goodloe, paymaster, U. S. Marine Crops.	Condemned marine clothing	8.95	....	8.95	
Apr. 13	New York	Jno. Furey, paymaster, U. S. Navy	Clothing sold to State of Rhode Island.	....	19.91	19.91	
18	San Francisco	H. T. Skelding, paymaster, U. S. Navy.	Sale of sectional dock	4,737.81	....	4,737.81	
29	United States Treasury	Reah Frazer, paymaster, U. S. Navy.	Gain on exchange	72.68	....	72.68	
29	Portsmouth, N. H	Joseph Foster, paymaster, U. S. Navy.	Sale of comdemned horse	30.00	....	30.00	
29	New York	O. C. Tiffany, paymaster, U. S. Navy.	Clothing sold to revenue steamer Crawford.	....	239.60	239.60	
May 10	......do	......do	......do		18.67	18.67	
20	......do	......do	Clothing sold to revenue steamer Johnson.	....	64.93	64.93	
19	......do	Arthur Burtis, pay inspector, U. S. Navy.	Wharf rents	125.00	....	125.00	
24	......do	......do	Condemned naval supplies	5,580.64	20,419.36	35,000.00	Clothing and small stores fund, $10,432.67; ordnance material, $18,986.69; miscellaneous receipts, $5,580.64.
June 1	United States Treasury	Arthur Peterson, passed assistant paymaster, U. S. Navy.	Gain on exchange	332.13	....	332.13	
1	......do	S. A. Frailey, paymaster, U. S. Navy.	Gain on exchange, etc	165.39	....	165.39	
May 19	San Francisco	H. T. Skelding, paymaster, U. S. Navy.	Condemned naval supplies	519.13	1,023.39	1,542.72	Clothing and small stores fund, $1,023.59; miscellaneous receipts, $519.13.
June 14	United States Treasury	L. C. Kerr, passed assistant paymaster, U. S. Navy.	Gain on exchange	2.18	....	2.18	
14	......do	W. W. Barry, paymaster, U. S. Navy.	......do	30.45	....	30.45	
14	......do	E. N. Whitehouse, paymaster, U. S. Navy.	Sale of old junk	30.00	....	30.00	
9	......do	C. A. McDaniel, paymaster, U. S. Navy.	Condemned naval supplies	5,851.55	2,223.57	8,075.12	Ordnance material, $2,223.57; miscellaneous receipts, $5,851.55.
21	New York	Arthur Burtis, pay-inspector, U. S. Navy.	......do	10,000.00	....	10,000.00	
23	United States Treasury	T. S. Thompson, paymaster, U. S. Navy.	Condemned military stores, Marine Corps.	.06	....	.06	
26	New York	O. C. Tiffany, paymaster, U. S. Navy.	Clothing sold to revenue steamer Johnson.	....	11.12	11.12	
27	United States Treasury	Seligman Brothers	Interest on daily balances	308.20	....	308.20	
28	......do	Stephen Rand, paymaster, U. S. Navy.	Condemned naval supplies	1,065.91	1,677.38	2,743.29	Clothing and small stores fund, $293.50; ordnance material, $1,383.88; miscellaneous receipts, $1,065.91.

Statement of deposits on account of sales of Government property, Navy Department, from November 1, 1892, to November 1, 1893—Continued.

Date of deposit.	Place of deposit.	By whom deposited.	Nature of property sold.	Amount covered to miscellaneous receipts.	Amount credited to the appropriation.	Total amount deposited.	Remarks.
1893.							
June 28	United States Treasury	H. B. Lowry, quartermaster, U. S. Marine Corps.	Fuel sold to officers		$478.20	$478.20	
26	Norfolk, Va	H. T. Stancliff, paymaster, U. S. Navy.	Condemned oxen, mule, and horse	$66.67		66.67	
30	United States Treasury	H. E. Jewett, assistant paymaster, U. S. Navy.	Gain on exchange	45.14		45.14	
July 1	Newport, R. I	C. S. Williams, passed assistant paymaster, U. S. Navy.	Received from Dundee Chemical Works for waste acid.	90.43		90.43	
12	Philadelphia, Pa	A. D. Bache, paymaster, U. S. Navy.	Wharf rents	369.17		369.17	
28	Baltimore, Md	James Fulton, pay director, U. S. Navy.	Clothing sold to cadets		346.74	346.74	
ug. 3	Boston, Mass	C. A. McDaniel, paymaster, U. S. Navy.	Condemned naval supplies	2,099.53	7.28	2,106.81	
7	United States Treasury	S. R. Colhoun, paymaster, U. S. Navy.	Gain on exchange	303.04		303.04	
10	do	Stephen Rand, paymaster, U. S. Navy.	Condemned naval supplies	66.00	17,474.30	17,540.30	Ordnance material, $17,474.30; miscellaneous receipts, $66.00.
15	do	H. B. Lowry, quartermaster, U. S. Marine Corps.	Condemned clothing and stores	28.25		28.25	
	do	L. A. Frailey, paymaster, U. S. Navy.	Sale of the U. S. S. Palos	5,145.10		5,145.10	
	York	O. C. Tiffany, paymaster, U. S. Navy.	Clothing sold to revenue steamer Forward.		348.84	348.84	
	Va	H. T. Stancliff, paymaster, U. S. Navy.	Condemned naval supplies	5,859.71	677.49	6,537.20	Clothing and small stores fund, $587.07; ordnance material, $90.42; miscellaneous receipts, $5,859.71.
	States Treasury	C. M. Ray, passed assistant paymaster, U. S. Navy.	Ground rent, Yokohama	167.69		167.69	
		H. B. Lowry, quartermaster, U. S. Marine Corps.	Condemned clothing and furniture	485.46		485.46	
		O. C. Tiffany, paymaster, U. S. Navy.	Clothing sold to revenue marine		420.97	420.97	
	es Treasury	H. B. Lowry, quartermaster, U. S. Marine Corps.	Condemned military stores	1.62		1.62	
		Arthur Burtis, payinspector, U. S. Navy.	Condemned naval supplies	2,020.58		2,020.58	
al				56,331.69	56,602.53	112,934.22	

REPORT

OF THE

JUDGE-ADVOCATE-GENERAL OF THE NAVY.

NAVY DEPARTMENT,
OFFICE OF THE JUDGE-ADVOCATE-GENERAL,
October 1, 1893.

SIR: In compliance with your order of June 15 last, I have the honor to submit herewith a report of the operations of this office for the fiscal year ending June 30, 1893:

Résumé of work of the office from July 1, 1892, to June 30, 1893.

Letters received		5,118
Letters sent		9,292
General courts-martial ordered and charges and specifications prepared:		
Officers	13	
Men	86	
		99
Examining boards		126
Retiring boards		28
Courts of inquiry and boards of investigation ordered		10
Records of general courts-martial received and examined		121
Records of summary courts-martial received and examined		725
General court-martial orders prepared and issued		104

Schedule of offenses upon which charges were preferred and trials had before naval general courts-martial, as shown by the records received at this office, during the past fiscal year:

Desertion	41
Scandalous conduct tending to destruction of good moral	21
Conduct to the prejudice of good order and discipline	17
Drunkenness on duty	15
Drunkenness	14
Disrespectful in language and deportment to superior officer while in the execution of the duties of his office	5
Disobeying lawful order of superior officer	4
Under influence of liquor on duty	4
Culpable inefficiency in the performance of duty	4
Assaulting and striking another person in the service	4
Disobedience of the lawful order of superior officer while in the execution of the s of his office	3
on of the twentieth clause of article 8 of articles for the government the Navy (violating a lawful general order issued by the Secretary of the v)	2
nbecoming an officer of the Navy	2
tion before being regularly relieved	2
and wounding another person in the Navy	2
or in possession	2

Refusing to obey lawful order of superior officer	2
Insubordination, to the prejudice of discipline and good order	2
Assaulting and attempting to strike another person in the service	2
Assaulting another person in the Navy	2
Assaulting with a deadly weapon and wounding another person in the Navy.	2
Using threatening, profane, and obscene language to superior officer	2
Falsehood	1
Absent from station and duty without leave	1
Violation of the ninth clause of article 8 of articles for the government of the Navy (culpable inefficiency in performance of duty)	1
Violation of the eleventh clause of article 8 of articles for the government of the Navy (through inattention, suffering a vessel of the Navy to be stranded)	1
Neglect of duty	1
Unlawful and felonious entry	1
Striking superior officer	1
Using abusive, profane, and threatening language towards superior officer	1
Sleeping on watch	1
Theft	1
Fighting while on duty	1
Through negligence suffering a vessel of the Navy to be run on a rock and hazarded	1
Violation of paragraph 145, page 51, of the regulations for the government of the Navy (1876) (not causing soundings to be taken on entering port)	1
Assaulting and striking superior officer while in the execution of the duties of his office	1
Treating superior officer with contempt and being disrespectful to him in language and deportment	1
Disobedience of orders	1
Using threatening and abusive language towards another person in the service	1
Resisting arrest	1
Assaulting and attempting to strike with a deadly weapon another person in the Navy	1
Violation of paragraph 16, page 76, of the regulations for the government of the Navy (1876) (issuing money without the authority of commanding officer)	1
Embezzlement	1
Violation of the seventeenth clause of the eighth article of articles for the government of the Navy (failing to use utmost exertion to apprehend a deserter).	1
Violation of the fifth clause of the fourteenth article of articles for the government of the Navy (forgery)	1
Violation of the sixth clause of the fourteenth article of articles for the government of the Navy (delivering less property than receipt called for)	1
Leaving post before being regularly relieved	1
Treating superior officer with contempt while in the execution of the duties of his office	1
Attempting to assault superior officer while in the execution of the duties of his office	1
Drunkenness while on guard detail	1
Resisting arrest, disorderly and mutinous conduct	1
Using profane, obscene, and threatening language	1
Assaulting and attempting to strike another person in the Navy	1
Violation of the ninth clause of article 4 of articles for the government of the Navy (leaving station before being regularly relieved)	1
Striking and assaulting superior officer while in the execution of the duties of his office	1
Absenting himself from station and duty without leave	1

Applications for removal of the mark of desertion: for issuance of certificate of discharge in true name: fixing date of discharge, etc.

Applications received for removal of charge of desertion	614
Cases in which charge of desertion has been removed	247
Cases in which application has been denied	278
Cases in which date of discharge has been determined by the Department	77
Cases in which issuance of discharge in true name has been authorized	28
Cases awaiting information called for from applicant	36
Cases awaiting information from other offices and bureaus	54
Letters sent in relation to desertion work	

The act entitled "An act to relieve certain appointed or enlisted men of the Navy and Marine Corps from the charge of desertion," approved August 14, 1888, contains the following clause:

> *And provided further,* That all applications for relief under this act shall be made to and filed with the Secretary of the Navy within the period of five years from and after its passage, and all applications not so made and filed within the said term of five years shall be forever barred, and shall not be received or considered.

The period limited by the clause above quoted during which applications for relief, under the act referred to, must be made, expired August 14, 1893. The limitation imposed by this clause does not however in any way affect applications filed prior to that date.

The total number of cases declined, as shown by the statement above given, is made up in part of cases which did not fall within the terms of the act, although perhaps meritorious. It has been the practice of the office in disposing of such cases to inform the applicant that Congress alone could grant the relief requested.

FRAUDULENT ENLISTMENT.

The act making appropriations for the naval service for the fiscal year ending June 30, 1893, approved March 3, 1893, contains the following clause:

> And fraudulent enlistment, and the receipt of any pay or allowance thereunder, is hereby declared an offense against naval discipline and made punishable by general court-martial, under article twenty-two of the articles for the government of the Navy; but this provision shall not take effect until sixty days after the passage of this act.

By circular dated April 12, 1893, the Secretary of the Navy directed that the clause of the act of March 3, 1893, above quoted, "be read and explained to each candidate for enlistment by the recruiting officer, who must satisfy himself that the candidate understands the provisions of the law."

Although the above enactment respecting fraudulent enlistment did not go into effect until May 2, 1893, trials and convictions have already been had under its authority, and it is believed that its effect upon the *morale* of the service will be excellent, inasmuch as it provides for the salutary punishment of a class of offenders who, not being regularly enlisted, were formerly beyond the reach of a naval court, although the offenses committed by them were strictly offenses against naval discipline and tended to exercise a demoralizing influence upon the service.

PURCHASE OF DISCHARGE.

The naval appropriation act approved March 3, 1893, also contained a clause providing that "in time of peace the President may, in his discretion, and under such rules and upon such conditions as he may prescribe, permit any enlisted man to purchase his discharge from the Navy or the Marine Corps, the amounts received therefrom to be covered into the Treasury." By General Orders Nos. 414 and 415, dated, respectively, July 3 and 10, 1893, the rules established by the President in accordance with the above provision were published for the information and guidance of all concerned. While this provision of law has not been in operation a sufficient time to enable the Department to [illegible] of its results, it is believed that it provides an appropriate mode [illegible] f[illegible]plicable to a class of cases which have heretofore presented [illegible] of hardship.

DEPOSITIONS.

Article 91 of the Articles of War provides that—

> The depositions of witnesses residing beyond the limits of the State, Territory, or District in which any military court may be ordered to sit, if taken on reasonable notice to the opposite party and duly authenticated, may be read in evidence before such court in cases not capital.

The effect of this statute is stated in Winthrop's Military Law to be, not merely to indicate when depositions shall be admissible, but to entitle parties to the depositions of witnesses when their personal testimony can not, without too great a delay or expense, or other prejudice to the service, be obtained. The articles for the government of the Navy contain no similar provisions. It frequently happens in the Naval service that a considerable time must elapse between the date on which an offense is committed and the convening of a naval court for the trial of the accused. In that interval witnesses may have been ordered to other duty on foreign stations, at a great distance from the place where the court is being held. It is often a grave question whether the interests of the public service require that such witnesses be subpœnaed and recalled from the regular duty to which they may have been assigned, involving loss of time and expense of travel, in order that they may give testimony at the trial.

While it is undoubtedly desirable that the testimony of witnesses be taken in open court and in the presence of the accused in all cases where it is practicable to do so, it would seem that a provision similar to that above quoted, authorizing the introduction in evidence before naval courts of depositions of witnesses stationed or residing at such a distance from the place where such courts are held that it is not practicable to secure their personal attendance, would materially promote the administration of justice in the Navy.

CIVILIAN WITNESSES BEFORE NAVAL COURTS.

Under existing statutes governing procedure in naval courts-martial and courts of inquiry civilians are not required to answer the subpœna of the judge-advocate of a naval court. It not unfrequently happens that important witnesses for the Government, whose testimony before a court-martial or court of inquiry is essential to the administration of justice, are civilians, whose attendance can not be enforced, and such witnesses are enabled to avoid the unpleasant duty of giving evidence concerning military offenses or frauds attempted or perpetrated against the Government, facts respecting which may be within their knowledge, by simply declining to appear.

Congress has conferred upon the Army the right to compel the attendance of civilian witnesses before military courts, but has failed to authorize a military court to punish such witnesses for contempt in case they decline to give testimony.

It is respectfully recommended that Congress be requested to take such action as may be necessary to enable naval courts-martial and courts of inquiry to summon civilian witnesses whose testimony may be required in order that the administration of justice may not be defeated, and, inasmuch as it would be idle to compel the attendance of witnesses who might, after their appearance in court, decline to give testimony, it is further recommended that naval courts-martial and courts of inquiry be empowered to punish such witnesses for contempt in case they refuse to testify.

PREVIOUS TRIAL AND CONVICTION.

Paragraph 1018 of the U. S. Army Regulations, 1889, provides that—

> After arriving at the findings the court may be opened to receive evidence of previous convictions. These convictions should be proved by the records of previous trials or by duly authenticated orders promulgating the same, showing the actual offenses of which the prisoner was convicted.

While evidence of previous trial and conviction of the offender would, manifestly, be inadmissible prior to the finding, it would seem proper that after a finding of "guilty" has been reached the court should receive evidence of former trial and conviction, if any, in order to determine whether or not the accused is an old offender, and, therefore, less entitled to leniency in the sentence about to be imposed than if on trial for his first offense. The adoption of this rule in the administration of naval courts martial is respectfully recommended.

LIMITATION OF PUNISHMENTS.

In consequence of the diversity in the constitution of courts-martial, an absence of uniformity is not infrequently observed in the punishments imposed by such courts. In order to equalize as far as may be the punishments awarded for like offenses, it is necessary that the revising authority maintain a close supervision over the sentences imposed. This is, however, an indirect and unsatisfactory remedy for an evil which might be dealt with more directly by legislative enactment.

A recent act of Congress contains the following provision, intended to cure a similar evil which had been found to exist in the Army, by promoting uniformity in sentences imposed by military courts-martial:

> That whenever by any of the articles of war for the government of the Army the punishment on conviction of any military offense is left to the discretion of the court-martial the punishment therefor shall not, in time of peace, be in excess of a limit which the President may prescribe.

Under the above provisions the President has prescribed the limits of punishment for a large number of offenses of most common occurrence in the Army, by an Executive order, published in General Orders No. 21, dated March 28, 1891, and this provision of law has, therefore, been in operation for a period of more than two years. The Judge-Advocate-General of the Army, in his annual report for the year ending September 30, 1891, speaks of the change as marking a most important era in the history of the administration of military justice in the American Army.

It is respectfully recommended that Congress be asked to empower the President to prescribe limits of punishment which shall not be exceeded by naval courts-martial.

INEQUALITY OF PUNISHMENT RESULTING FROM SUSPENSION OF OFFICERS FROM DUTY.

A striking illustration of the inequality of punishments, which frequently results from sentences of general courts-martial, is afforded by an examination of the cases of officers sentenced to suspension from rank and duty, on reduced pay, and to retain present number during the period of suspension.

Promotion, although proverbially slow in the Navy, is from natural causes, and by reason of casualties, more rapid at certain times than at others, and an officer suspended from duty by sentence of court martial, as above stated, may suffer a very light punishment, in consequence of the fact that but few vacancies occur during his term of suspension, while another officer, under the same circumstances, but at a time when a large number of vacancies occur, may lose many numbers; and this may be the case with officers found guilty of the same offense and sentenced to the same term of suspension.

It may even be the case that an officer receiving a short sentence of suspension from duty really suffers a more severe punishment than another officer convicted of a graver offense and sentenced to a longer period of suspension.

In order to prevent such inequality, and as a means of equalizing the sentences of officers, it is suggested that courts-martial, in the case of an officer found guilty of an offense for which greater punishment is not deemed necessary, should, instead of suspending him from duty, sentence the accused to be reduced a certain number of files, or to retain his present number on the list until he shall have lost a certain number of files in his grade. If this method were adopted it would have the further effect of avoiding the evils arising from the sentence of suspension from duty, under which an officer, while receiving more or less pay from the Government, performs no service and is cut off from the advantages of continued active participation in the duties of his profession. It is, of course, to be borne in mind that courts-martial, while they may reduce an officer in his grade, have no power to place him in a lower grade.

NAVAL EXAMINING AND RETIRING BOARDS.

The present system of examinations in the Navy, which has been built up piecemeal by a succession of disconnected enactments, is rather cumbersome, and in some cases results in confusion and delay. I am of opinion that the efficiency of the service would be promoted if the statutes providing for the examination and retirement of officers of the Navy were assimilated to those providing for the examination and retirement of officers of the Army and Marine Corps, on account of the greater simplicity and efficiency of the methods prescribed by the latter. Under existing statutes regulating promotion and retirement in the Navy, no officer can, under ordinary circumstances, be promoted to a higher grade on the active list until he shall have been examined by a board of naval surgeons and pronounced physically qualified to perform all his duties at sea. If, upon such examination, it appears that the officer is not physically qualified for promotion, the examining board finds accordingly, and the candidate is subsequently ordered before a retiring board, in order to determine whether or not he shall be retired from active service, and if so, upon what pay, if any, he shall be retired.

The act "to provide for the examination of certain officers of the Army, and to regulate promotions therein," approved October 1, 1890, which subsequently, by the act approved July 28, 1892, was made applicable to the Marine Corps, was enacted in the light of the experience of the operation of the laws providing for examinations in the Navy. It is recommended that the operation of the act of October 1, 1890, be further extended so as to be made applicable to the Navy. It is, however, suggested that the act, in its application to the Navy, be so amended that in cases where the board finds a candidate physically disqualified for promotion, and, accordingly, resolves itself into a retiring board, it shall be the further duty of such board to proceed to examine into the record of the candidate, so far as may be necessary to ascertain whether or not his physical inability to perform at sea the duties of the place to which it is proposed to promote him is the result of drunkenness, or any cause arising from his own misconduct.

This amendment is suggested in order that the provision now contained in section 1456 of the Revised Statutes that "no officer of the Navy shall be placed on the retired list because of misconduct," and the similar provisions of the act of August 5, 1882, may be preserved.

It is further recommended that the law for the examination of officers as to their physical, mental, moral and professional qualifications for promotion be made to embrace Passed Assistant Surgeons upon their promotion to the grade of Surgeon, and Chief Engineers upon promotion to higher relative rank in that grade.

NATURALIZATION BY ENLISTMENT AND SERVICE IN THE U. S. NAVY.

Section 2170 of the Revised Statutes of the United States provides that "no alien shall be admitted to become a citizen who has not for the continued term of five years next preceding his admission resided within the United States," and by section 2165 it is further provided that "it shall be made to appear to the satisfaction of the court admitting such alien that he has resided * * * within the State or Territory where such court is at the time held one year at least."

It would seem that upon considerations of public policy naturalization laws should be so framed as to permit, if not to require, enlisted men serving upon our vessels of war to become citizens of the United States. Instead, the statutory provisions above quoted practically deprive an enlisted man, who is an alien, of the privilege of becoming a citizen so long as he continues in the Navy. It is only by leaving the Navy for a time, at least, and thus giving up the advantages of continuous service, that such alien can become a citizen. Cases have recently come to the attention of this office wherein enlisted men have rendered honorable service in the Navy for a period of more than twenty years without becoming citizens of the United States.

Section 2174 of the Revised Statutes extends to any seaman, who declares his intention to become a citizen of the United States, and who shall have served three years on board a merchant vessel of the United States, subsequent to the date of such declaration, the privilege of admission to citizenship, and section 2166 provides that any alien of the age of 21 years and upwards who has been honorably discharged from either the regular or volunteer forces of the U. S. Army shall be admitted to become a citizen of the United States without any previous declaration of his intention to become such, upon proof of one year's residence within the United States previous to his application to become a citizen.

While the naturalization of our merchant seamen and of enlisted men serving in the Army is thus properly provided for, the statutes contain no similar clause conferring like privileges upon enlisted men serving upon our vessels of war. This is an unnecessary and unjust discrimination against enlisted men in the U. S. Navy. The hardship resulting from this state of affairs is increased by the following provision incorporated in the "act making appropriations for the payment of invalid and other pensions of the United States for the fiscal year ending June thirtieth, eighteen hundred and ninety-four, and for other purposes:"

> That from and after July first, eighteen hundred and ninety-three, no pension shall be paid to a nonresident, who is not a citizen of the United States, except for actual disabilities incurred in the service.

It is recommended that the particular attention of Congress be invited to this subject, in order that such legislation may be enacted as will correct the evils referred to.

CERTIFIED CHECKS IN LIEU OF BONDS.

Section 3719 of the Revised Statutes provides that every proposal for naval supplies invited by the Secretary of the Navy * * * shall be accompanied by a written guarantee, signed by one or more responsible persons, to the effect that he or they undertake that the bidder, if his bid is accepted, will, at such time as may be prescribed by the Secretary of the Navy, give bond, with good and sufficient sureties, to furnish the supplies proposed; and no proposal shall be considered unless accompanied by such guarantee.

Complaint has been made to the Department that many large dealers are deterred from submitting proposals to furnish naval supplies, in cases where comparatively small quantities of articles are called for under numerous classes, on account of the trouble and annoyance of obtaining bondsmen, in case they should be awarded contracts for one or more of such classes. It is urged that such dealers would have no objection to giving bond in the case of large contracts, but that they do not care to submit proposals which might result in their obtaining a number of minor contracts, consisting of one or more small classes of the articles for which proposals are solicited by the Department.

It is suggested that such dealers would be glad to submit proposals in many cases, if, instead of the guarantee required by law to accompany the proposal, and in lieu of the bond required to accompany the contract, certified checks of bidders for the full amount covered by the contract could be accepted by the department. It would seem that the security afforded by a certified check in such cases would be amply sufficient, and it is respectfully recommended that Congress be asked to authorize the acceptance of certified checks in cases where the Secretary of the Navy shall deem such action to be for the best interests of the service.

NEW VESSELS.

Upon the passage of an act authorizing an increase in the naval establishment, the Bureaus of Equipment, Construction and Repair, and Steam Engineering, after deciding upon the character of the requirements to be laid down relating to the construction of the vessels authorized and their machinery, equipment and fittings, furnish this office with the information and data necessary to be embodied in the advertisements inviting proposals for the construction of the vessels, and in the form upon which proposals to be submitted thereunder are required to be made.

The advertisements and the forms of proposal are prepared in this office. In the advertisement the vessels are designated according to number, and the displacement as prescribed in the acts relating thereto is stated, and inasmuch as it has been prescribed in each act passed since the act of August 3, 1886, entitled, "An act to increase the naval establishment," by which the construction of additional vessels has been authorized, that the provisions of the latter mentioned act, as to materials for said vessels, the contracts under which they are built and the advertisements and proposals therefor, shall be observed and followed, save that in all their parts the vessels shall be of domestic manufacture, it being provided by the act of August 3, 1886, that such shafting as the Secretary of the Navy could not procure of domestic manufacture might be procured in foreign countries, the provisions of said act of August 3, 1886, referred to are quoted in the advertisement.

In the advertisement notice is given as to whether or not the armor and the equipment are to be furnished by the Government; and the provisions to be inserted in the contract relating to the speed required of the vessel, the horse power to be developed by her engines, the premium to be paid for increased speed or horse power and the deductions to be made from the contract price on account of failure to develop and maintain the required speed or horse power, are specified. The time within which the vessel is to be completed and the number of payments to be made as the work progresses, and the circumstances under which payments will be made are also stated.

In all the acts prior to that of March 3, 1893, authorizing the construction of vessels it has been required of the Secretary of the Navy that he shall receive proposals "from every American shipbuilder and other person who shall show to the satisfaction of the Secretary of the Navy, that within three months from the date of the contract he will be possessed of the necessary plant for the performance of the work in the United States which he shall offer to undertake," but in the act of March 3, 1893, it is provided that "the Secretary of the Navy shall not receive or consider bids from any party or parties not provided with a plant suitable to do the work," and said act further provides that "in awarding the contract for any one of these ships the Secretary of the Navy shall award the contract at the price of the lowest bid to that one of the parties bidding on any such ship which in his judgment it is in the interest of the Government to have to do the work," whereas it had been required theretofore that the contract should be let to the lowest and best responsible bidder.

In order to increase the chance of having vessels constructed in accordance with the best designs obtainable the opportunity is given bidders to submit proposals under two classes: Those of class 1 to be for the construction of the hull and machinery, including engines, boilers and appurtenances, and equipment, if required, complete in all respects, in accordance with the plans and specifications provided by the Secretary of the Navy: and those of class 2 to be for the construction of the hull and machinery, including engines, boilers and appurtenances, and equipment when required, complete in all respects, in accordance with the plans and specifications provided by the bidder, bidders being allowed to adopt the plans and specifications of the department for hull and machinery, or any part of either, and embody them in their plans and specifications.

For the purpose of determining whether bidders are acting in good faith and in order to aid in ascertaining their responsibility bidders are required to submit with their proposals in each case a certified check for about 5 per cent of the amount of the bid.

Within a reasonable time before the date fixed for the opening of bids, usually about five weeks, the necessary forms of proposal, class 1 and class 2, are prepared and sent to the Bureaus of Construction and Repair and Steam Engineering for distribution in answer to calls therefor from persons intending to bid. In each of the forms of proposal is inserted a copy of the advertisement; instructions to bidders relative to the preparation and signing of proposals, and a general statement of the provisions to be included in the contract for the construction of the vessel in accordance with the appropriate form of proposal.

The general statement of provisions referred to above embodies in detail all the provisions that are afterwards inserted in the contracts. Bidders are thus accurately informed as to all the obligations incurred by them in making proposals, including the requirements relating to changes in the plans and specifications: the stipulations relating to the furnishing of armor by the Government; the insurance to be placed on the vessels; the protection of the Government against the use of patented inventions; the deductions from the contract price for delays in the completion of the vessel, and the circumstances under which such deductions are to be made; the limits prescribed for the weight of machinery; the conditions prescribed for the trial of the vessel and her acceptance; the premiums over and above, or the deductions from the contract price on account of increased or diminished speed or horse power; the circumstances under which the vessel may be rejected, and the discretion of the Secretary of the Navy to declare the contract forfeited in case the work be not prosecuted satisfactorily, and to complete the vessel at the expense of the contractors.

It has been the custom heretofore to provide in the contracts for vessels that the expenses of the successful trial trip in each case shall be borne by the Department, but in view of the numerous disputes and contentions that have arisen from time to time concerning the allowance of certain items and charges incurred in connection with such trials, that custom has been departed from in the case of the last three vessels authorized, in the proposals for which it is stated that the expenses of all trials shall be borne by the contractors. This method seems to be best adapted for the settlement of the trial-trip expenses, and it is recommended that the same be adhered to in the future.

Upon the opening of proposals received in answer to advertisements for the construction of vessels, all the proposals are referred to the Bureaus of Construction and Repair and Steam Engineering for recommendation as to which, if any, of said proposals shall be accepted. Upon the return of the proposals to the Department from the Bureaus, the necessary communications to bidders informing them of the acceptance or rejection of their bids are prepared in this office, and, after being signed by the Secretary of the Navy, are forwarded to them, the checks accompanying the proposals of the unsuccessful bidders being returned and the checks of the successful bidder in each case being retained until the execution of the contract and bond.

As soon as practicable after the award of the contract, the form of contract is prepared and forwarded to the contractor for execution, together with a bond in a penal sum, usually about 15 per cent of the contract price. The question as to whether the bond given is satisfactory, and the sureties thereon good and sufficient is, by the authorizing act, left to the discretion of the Secretary of the Navy.

The contract is executed on the part of the Government after its execution on the part of the contractors, and the bond, if deemed satisfactory, is formally approved by the Secretary of the Navy. The contract and bond are executed in triplicate, and one of the triplicates is returned to the contractor and one is sent to the Second Comptroller of the Treasury to be deposited in his office, in accordance with the provisions of section 3743 of the Revised Statutes, and copies of the contract and bond, and of the advertisement and of all proposals received, are sent to the Returns Office, Interior Department, as required by section 3744 of the Revised Statutes.

TRIALS OF VESSELS.

In accordance with provisions embodied in each of the contracts for the construction of naval vessels stipulating that vessels shall be subjected to a trial trip, in order to test the hull, fittings, and machinery, including engines, boilers, and appurtenances, as well as equipment and speed, contractors are required to notify the Department when the vessels under construction are ready to be subjected to trial. Upon receipt of such notification, orders for the trial board are prepared in this office, designating a course over which the trial is to be made, the conditions relating to the trial, the performance required of the vessel and her machinery, and the manner in which the speed is to be determined, and the board is instructed as to the matters to be embodied in its report.

Upon its receipt, the trial board's report is referred to the Bureaus of Construction and Repair and Steam Engineering for report, and if it be found that the trial was not successful, and if the contractors so desire, they are allowed to make additional trials, to be limited in number by the Secretary of the Navy, as provided in the contract; but if the trial be successful, the requirements of the contract having been fulfilled, the vessel is accepted either "preliminarily" or "conditionally," according to the manner in which the contract requirements as to the speed or horse power to be developed and maintained have been fulfilled; the acceptance being "preliminary" if the speed or horse power developed and maintained equal or exceed the requirements, or "conditional" in case the speed or horse power developed and maintained fall below that required for preliminary acceptance, but not below the limit set for rejection of the vessel.

The contract for each vessel provides that after her acceptance she shall be subjected to a final trial within a fixed period after her "preliminary" or "conditional" acceptance, usually about five or six months, according to whether the vessel is constructed in accordance with a proposal of class 1 or of class 2. In order to carry out this requirement a final trial board is appointed, the order to the board giving instructions in full for its guidance. The report of this board is also referred to the Bureaus of Construction and Repair and Steam Engineering, and if it be ascertained that the vessel is in the condition required by the contract she is finally accepted; otherwise her final acceptance is delayed until she shall have been placed by the contractors in such condition.

CHANGES IN CONTRACTS.

The contracts for vessels as drawn by the Department require that the drawings, plans, and specifications shall not be changed in any respect when the cost of such change shall, in the execution of the work, exceed $500, except upon the written order of the Secretary of the Navy; and that when changes are made by order of the Secretary the actual cost thereof, and the damage, if any, caused thereby, shall be ascertained, estimated, and determined by a board of naval officers, whose determination as to the amount of increased or diminished compensation to be allowed for such change shall be final and binding upon the contractors.

In pursuance of this clause, and upon the receipt from the general inspector, the superintending constructor, or the superintending engineer of a vessel under construction, of a report made in writing to the Department or to the bureau concerned, recommending that a certain change in the drawings, plans, or specifications be made, such recommendation is forwarded by the Bureau to the Department with remarks expressing the Bureau's views respecting the proposed change. The papers are then referred to the board on construction, composed of the chiefs of the Bureaus of Yards and Docks, Ordnance, Construc tion and Repair, Steam Engineering and Equipment, and the Chief Intelligence Officer of the Navy, which either approves or disapproves of the recommendation. If the board on construction disapproves of the change, and the Department concur in such disapproval, the Bureau is advised thereof, and instructed to notify the contractors and the superintending constructor or engineer, or the general inspector, as the case may be. If, on the other hand, the board on construction approves of the proposed change and the Department concur therein, the Department authorizes the Bureau concerned to notify the contractors to proceed with the work and to have the cost of such work determined by a board on changes. At the proper time the Department orders a board on changes, which considers the question and estimates the amount of increased or diminished cost to which the contractors are entitled. The report of the board on changes is made to the proper Bureau, and the Bureau either approves or disapproves of such finding, and forwards the papers to the Department for final action thereon. If the finding of the board be disapproved by the Department, it is sent back for reconsideration; if approved, the report of the board is returned to the Bureau concerned, which when the work is completed, prepares bills in accordance therewith. These bills on being presented to the Department are regularly passed through this office in the same manner as other bills.

BILLS.

The contracts prepared in this office for the construction of vessels or for public works of any kind contain a clause which, after stating the contract price, provides that payments shall be made in a specified number of equal installments as the work progresses, with a reservation of a certain percentage from each installment. It is also provided that no payment shall be made except upon bills, in quadruplicate, certified by the inspectors in such manner as shall be required by the Secretary of the Navy, whose final approval of all bills thus certified shall be necessary before payment thereof. In accordance with these provisions bills are regularly forwarded through this office in order that they may be examined and prepared for the action of the Secretary of the Navy. The duty of this office in the matter is, to ascertain whether the amount of the payment is proper; whether the contract time has or has not expired; and to determine definitely whether the payment of the money as called for in the bill under examination is in all respects in accordance with the terms of the contract, and whether all penalties, forfeitures, and general and special reservations have been duly deducted.

INSURANCE.

The contracts for the construction of vessels, contain a clause providing that the hull, machinery, fittings, and equipment of the vessel contracted for, and all materials and appliances provided for and used in the construction thereof, shall be kept duly insured, which insurance shall be renewed and increased from time to time, by and at the expense of the contractors, the loss, if any, to be stated in the policies as payable to the Secretary of the Navy. The insurance is to be effected in such manner and in such companies as shall be approved by the Secretary of the Navy, and in an amount to be fixed from time to time by him, not exceeding the amount of the advance payments made under the contract.

In pursuance of these requirements this office, as soon as the first payment is made upon a vessel under construction by contract, and immediately after every succeeding payment, notifies the contractors of such payment and asks that insurance be placed covering the amount thereof. These policies, when received, are carefully examined, and, if found in all respects correct, are placed on file, but if any mistakes or defects are found in them they are returned to the contractors for correction. During the building of the ship the Department simply requires policies of amount sufficient to cover fire risks; but prior to the launching of the ship the contractors are required to insure to cover risks incident to the launching; and again, before the vessel goes upon the contractors' trial, or the preliminary trial, the contractors are notified to place insurance to cover marine risks. All unexpired policies are kept in this office until the acceptance of the ship, when they are returned to the contractors.

LIVE OAK TIMBER RESERVATIONS.

A number of tracts of land in the States of Florida, Alabama, and Mississippi, lying adjacent to the waters of the Gulf of Mexico, have for a long period of years been reserved from the public domain for the use of the Navy Department, as a source of supply of live oak timber. In consequence of recent progress in naval construction, live oak timber is no longer extensively used in building ships of war, and, as a matter of fact, the Department has found difficulty in utilizing or disposing of a considerable quantity of such timber which has accumulated at some of the more important navy yards. Thousands of feet of live oak timber, condemned as useless for naval purposes, were recently sold at public auction at the navy-yards at Boston and New York at a merely nominal price.

It appears from reports made to the Chief of the Bureau of Construction and Repair that live oak timber is not now to be found upon any considerable portion of the tracts of land in question, and that it is difficult for the Navy Department to protect from trespass and depredation such timber as remains upon the naval reservations. In addition, the maintenance of large tracts of land in a state of reservation which are not likely to be utilized in any way by the Government presents a constant temptation to trespassers and squatters, and is a barrier to legitimate settlement.

Under these circumstances, and inasmuch as it appears that the purposes for which these lands were severed from the public domain have passed, and that their continued existence as live oak timber reservations no longer serves any useful purpose, the advisability of restoring to the public domain and opening to settlement the naval reservations in question is respectfully suggested.

The Department is not in possession of definite information respecting the condition of the naval reservations in the States of Florida and Alabama, but it appears from a report forwarded by the Bureau of Construction and Repair, under date of May 3, 1888, that tracts of land have been reserved for live oak purposes in the counties of Harrison, Hancock, and Jackson, Miss., as follows:

Round Island, Mississippi Sound, 139 acres; timber worthless for naval purposes.

Pascagoula River, about 564 acres; live oak scattered; generally defective.

Biloxi Bay, two-thirds of the live oak cleared off twenty years ago; several persons living on clearings.

Harrison and Jackson counties, 22,951 acres; timber is chiefly pine; great difficulty of transportation.

Clear Point, in Hancock County, 2,168 acres; timber live oak, but scrubby and small; greater part dead; that which is living defective from fires.

In forwarding this report the Bureau states that it sees no benefit to be derived by the Government in retaining these live oak and pine reservations, and suggests that they be disposed of.

The report above quoted relates to a portion only of the lands now held as naval reservations. Before the Department could make intelligent recommendation to Congress in the matter it would appear necessary that more particular information be obtained respecting the present condition and value for naval purposes of other reservations located in Mississippi, as well as those in the States of Alabama and Florida.

SALE OF NAVY-YARD LANDS, BROOKLYN, N. Y.

By a special act of Congress, approved December 22, 1892, the Secretary of the Navy was authorized to sell to the city of Brooklyn "for market purposes, and for slips, canals, and piers, and other public works in connection with such market purposes," a tract of land lying within the limits of the navy-yard, New York, at the intersection of Flushing and Washington avenues. Section 3 of the act stipulated that the price at which said lands should be sold, "whether under water or not," should not be less than $41,000 per acre; and it was further provided in the same section that the question of excess of value, if any, over and above the sum named, should be submitted to and determined by a board of three appraisers, subject to the approval of the Secretary of the Navy.

In accordance with these requirements of the act, the tract of land referred to, having been carefully surveyed and found to contain 27.152 acres, was duly appraised by a board of appraisers appointed for that purpose, and its value was fixed and determined by such board to be $1,208,666. This appraisement being above the minimum price, $41,000 per acre, fixed by Congress, was, on the 21st of February, 1893, approved by the Secretary of the Navy.

Section 4 of the above-named act of December 22, 1892, contained the following provisions:

> SEC. 4. That * * * if within six months after the filing of such report the mayor of the city of Brooklyn shall notify the Secretary of the Navy that the city of Brooklyn will purchase said property for market purposes and for slips, canals, and piers, and other public works in connection with such market purposes, the Secretary of the Navy shall, upon receipt of the purchase money, execute and deliver to the city of Brooklyn a full and sufficient deed of conveyance of such property.

On the 10th of August last, prior to the expiration of the period of six months after the filing of the report of the board of appraisers, fixed by the act as the time within which such notice must be given, Hon. David A. Boody, mayor of the city of Brooklyn, addressed a communication to the Secretary of the Navy giving the official notice of intended purchase required by section 4 of the act, and at the same time transmitting a certified copy of an act of the legislature of the State of New York, entitled "An act to authorize the United States of America to close Wallabout channel, in the city of Brooklyn," approved by the governor May 10, 1893, together with a certified copy of the resolution adopted by the common council of the city of Brooklyn February 20, 1893, giving the consent of the city to the closing of said channel. To this communication the Secretary of the Navy replied, under date of the 14th of August, stating that the Department was prepared to conclude the sale of the property and would be glad to do so at the early convenience of the authorities of the city of Brooklyn.

The act of December 22, 1892, does not authorize the use for naval purposes of the sum to be received from the city of Brooklyn for the lands in question, but requires that said sum, after deducting the expenses of surveys, appraisals, and conveyance, shall be paid into the Treasury of the United States. By the act making appropriations for the naval service for the current fiscal year, however, it is provided that the sum of "$300,000, to be paid from proceeds of sale of portion of Brooklyn Navy-Yard, under act of Congress," may be expended upon improvements at the navy-yard, Brooklyn, N. Y.

RIGHT OF WAY GRANTED TO THE PENSACOLA TERMINAL COMPANY THROUGH PENSACOLA NAVAL RESERVATION.

By the act approved July 21, 1892, Congress granted to the Mexican Gulf, Pacific and Puget Sound Railroad Company the right of way "over and through the United States naval and military reservations near Pensacola, in the State of Florida." Subsequently, by the act approved July 28, 1892, a like right of way over the lands of the Pensacola naval reservation was granted to the Pensacola Terminal Company.

The locations selected by these two companies, as indicated on the maps and plans filed by them in pursuance of the requirements of the acts of Congress above mentioned, were so nearly identical that the selections made by both companies could not be approved by the Department. Under these circumstances the Department suggested to the respective companies that they reach an agreement in the matter by the selection of locations not interfering with each other. After extended correspondence upon the subject, in the course of which it appeared that the representatives of the Mexican Gulf, Pacific and Puget Sound Railroad Company were not prepared to proceed at once with the construction of their road, that company waived its objections to the approval by the Department of the route selected by the Pensacola Terminal Company. The line selected by the latter company was accordingly, under date of December 28, 1892, approved by the Department, in accordance with the provisions and subject to the terms and conditions prescribed by the act of July 28, 1892. The construction of its road bed has since been substantially completed by the Pensacola Terminal Company, but the road has not yet been fully equipped.

The value of the use of certain lands in the town of Warrington, appropriated for the purposes of the railroad company, under the powers granted to it by the act, was duly appraised, and the amount so appraised paid by the company.

COALING STATION AT PAGO PAGO, SAMOA.

By article 2 of the treaty concluded January 17, 1878, between the United States and the Government of the Samoan Islands, it is provided that "naval vessels of the United States shall have the privilege of entering and using the port of Pago Pago and establishing therein and on the shores thereof a station for coal and other naval supplies for their naval and commercial marine; and the Samoan Government will hereafter neither exercise nor authorize any jurisdiction within said port adverse to such rights of the United States or restrictive thereof."

For the purpose of permanently establishing a station for coal and other supplies for the naval and commercial marine of the United States on the shores of the bay of Pago Pago, and "for such other purposes as may, in the judgment of the President, be necessary to confirm the rights of the United States under article 2 of the treaty of 1878," Congress, by the act approved March 2, 1889, appropriated the sum of $100,000. (25 Stats. p. 815.)

In the summer following the passage of this act, Rear-Admiral L. A. Kimberly, U. S. Navy, in pursuance of instructions from the Department, made a careful survey of the harbor of Pago Pago, and selected as the most suitable site for the proposed naval station a tract of land containing about 121 acres, lying just back of Swimming Point and Goat Island, on the south shore of the bay.

Under the system of land tenure existing among the natives of the Samoan Islands this body of 121 acres was originally divided into small tracts, of irregular size and shape, each tract being designated by a distinctive name and not by its area or boundary lines. Title to lands in these islands rests by custom in families and not in individuals. Under these circumstances, the site selected by Rear-Admiral Kimberly could not be purchased as a whole, but separate negotiations with the representatives of the native families owning the several tracts, or with foreign claimants thereto, have been necessary. In conducting these negotiations the Department has been aided by the consul-general of the United States at Apia, through whose coöperation the purchase of the following tracts and claims has been concluded.

1. Goat Island, area 1 rod 7 perches, purchased from natives January 16, 1891, for the sum of $214.29.

2. Swimming Point, area 1 rod 6 perches, purchased from natives March 31, 1891, for the sum of $200.

3. Sogelau, area 1 acre 1 rod 24 perches, and Mauga-o-alii, area 6 acres 1 rod 22 perches, purchased from William Cooper August 27, 1891, for the sum of $1,000.

4. Claim of the Wellman estate, purchased from executors April 18, 1892, for the sum of $977.50. This purchase includes all interest of the Wellman estate in lands lying within the site selected by Rear-Admiral Kimberly.

5. The Sherwood claim to all lands within the site, purchased from Harris and others June 18, 1892, for the sum of $1,750.

6. Property formerly leased for deposit of coal, purchased from P. H. Krause July 19, 1892, $1,100.

By the above purchases the United States has secured not only the native title, but all known outstanding claims to the tracts of land above mentioned. If the purchase of additional lands, adjacent to these tracts, is deemed desirable, such additional lands can, in all probability, be purchased directly from the native owners at a reasonable price.

By the "general act concluded by and between the United States of America, the Empire of Germany, and the United Kingdom of Great Britain and Ireland, providing for the neutrality and autonomous government of the Samoan Islands," concluded at Berlin, June 14, 1889

(26 Stats., p. 1497), it is declared "in order that the native Samoans may keep their lands for cultivation by themselves and by their children after them * * * that all future alienation of lands in the islands of Samoa to the citizens or subjects of any foreign country, whether by sale, mortgage or otherwise, shall be prohibited." It is further provided by the same act that all claims by aliens of titles to lands, or any interest therein, in the islands of Samoa, be submitted to a land commission created by the act, and it is made the duty of the land commission to report to the supreme court of Samoa all claims to lands in the islands, together with all the evidence affecting their validity. The court is also authorized to make provision for a complete registry of all valid titles to lands in the islands of Samoa which are or may be owned by foreigners. In view of these provisions of the general act referred to, the original deeds to the several tracts of land purchased by the United States, as above stated, have been transmitted to the land commission, in order that the titles therein conveyed to the United States may be duly reported to the supreme court created by the general act of June 14, 1889, for confirmation.

THE COLUMBIAN CARAVELS.

In the summer of 1891 the Department of State designated Lieut. W. McCarty Little, U. S. Navy, retired, as its agent, and sent him to Europe, subject to the control of the Bureau of American Republics, for the purpose of negotiating with the Spanish Government for the construction of reproductions of the caravels *Santa Maria*, *Nina*, and *Pinta*, composing the fleet of Columbus on his first voyage of discovery in 1492.

As a result of Lieut. Little's negotiations with the Government of Spain, that Government agreed to construct the largest of the three caravels, the *Santa Maria*, and send it to the World's Columbian Exposition as a part of its exhibit there, if the United States would construct the other two caravels. This proposition was accepted by the Department of State, and Lieut. Little, after inviting proposals, entered into contract with the lowest bidders, Messrs. Park and Cardona, of Barcelona, for the construction of the *Nina* and *Pinta* for the sum of 70,000 francs ($13,510).

By a clause contained in the naval appropriation act approved July 19, 1892, the Secretary of the Navy was empowered to construct reproductions of the Columbus caravels *Nina* and *Pinta*, and the business being conducted in that connection by Lieut. Little was transferred by the Department of State to this Department, and in order that the expenses thereof might be properly paid from the appropriation made by Congress a form of contract for the construction of the *Nina* and *Pinta*, embodying the provisions of the contract with Messrs. Park and Cardona, above referred to, was duly entered into and the work of construction of the caravels proceeded to completion in accordance therewith.

The caravels were completed in time to participate in the Columbus celebration at Huelva, Spain, October 12, 1892, and were afterwards, in accordance with an understanding with the Spanish Government, towed by the U. S. ships *Newark* and *Bennington* to Havana, Cuba, and there, having been turned over to the Spanish authorities, they were officered and manned by Spanish officers and seamen. The caravels participated in the international naval review held in New York harbor in May last, and were afterwards, in company with the *Santa Maria*, taken to Chicago, where they are now on exhibition. The *Santa Maria* has been donated to the United States by the Spanish Government.

CHILEAN INDEMNITY FUND.

Under date of October 14, 1892, the Secretary of State addressed a communication to the Secretary of the Navy, inclosing "an order drawn by the director of the treasury of Chile upon the Chilean minister at Paris, for $75,000," and stating that the order referred to had been presented to our minister at Santiago by the minister of foreign affairs of Chile with the request that he would cause its avails to be distributed among the seamen of the U. S. S. *Baltimore* who received personal injuries, and the families of the two seamen who were killed at Valparaiso on the 16th of October, 1891. Through the courtesy of officers of the Treasury Department, the order above referred to was promptly collected, without loss by exchange.

Precedent for such action in the case of funds of like character having been found, the distribution of the fund presented by Chile was undertaken by this Department, and a board of naval officers, consisting of Capt. W. S. Schley, Lieut. Commander Uriel Sebree, and Passed Assistant Surg. Edward R. Stitt, U. S. Navy, was appointed by the Department for the purpose of considering and determining the proportionate amount in which the sum mentioned should be distributed to the persons for whom it was intended. The members of this board, all of whom were attached to the U. S. S. *Baltimore* at the time of the attack on the American sailors at Valparaiso, were aided in the consideration of the question submitted to them by an examination of the "official evidence taken by the board convened at Valparaiso to determine the cause and extent of the assault; the official log book of the U. S. S. *Baltimore* covering the period of the assault; the sworn official testimony taken by the Judge Advocate-General of the Navy at Mare Island, California, January, 1892; the medical records showing those under treatment afterwards; and the claims forwarded from the Department, as made by a large number of the men through attorneys at law." The board, under date of January 9, 1893, submitted a report reecommending the following distribution of the fund:

To the family of Charles W. Riggin	$10.000
To the family of William Turnbull	10,000
Jeremiah Anderson	5,500
John Hamilton	5,000
John W. Talbot	4,000
John H. Davidson	3,000
George Panter	2,500
William Lacey	2,000
Herman Fredericks	1,500
Henry C. Jarrett	1,500
John Mc. Bride	1,500
John Butler	1,500
Charles G. Williams	1,200
William Sullivan	1,200
Warren Brown	1,200
R. J. J. S. Hodge	1.200
Thomas Gallagher	1,200
William H. Christie	1,200
John W. Freese	1.200
Joseph Quigley	1,000
Frederick Clifford	1,000
Edward Duncan	1,000
Patrick McWilliams	900
Frank H. Smith	800

Michael Houlihan	$800
John Rooney	800
William Caulfield	750
Charles H. Guth	750
Patrick O'Neil	750
James M. Johnson	700
Condy Boyle	550
Lee Andrew Wallace	500
Patrick Eagan	500
Andrew Nelson	500
Henry Cunningham	500
Henry Cass	500
Olaf Wetteland	500
John Downey	400
John Carson	400
James Gillan	400
Samuel W. Cook	400
Peter Johnson	400
John B. Larson	300
Frank Honnors	300
Alexander J. Stewart	300
Owen Canning	300
Charles B. Semper	300
John F. McAdams	300
Alfred Pfeiffer	300
Neil Boyle	300
Adolph Swanson	300
William H. Nichols	300
John J. Bechtele	300
James Shields	500

The board concluded its report with the following recommendation:

> Further, as this indemnity fund was voluntarily offered and paid by the Chilean Government, and accepted by the United States in full for all injuries sustained by the men of the *Baltimore*, and as our Government was not aided or assisted in any way by any attorney acting in the interest of the men, the board would recommend that the amounts named be paid directly to the men themselves.

The report and recommendations of the board were approved by the Department, and payment to the persons named in said report, or to their duly appointed executors or administrators in the case of those deceased, of the sums respectively set opposite their names, was authorized, with this "exception, that no payment shall be made to Joseph Quigley, second-class fireman, reported as having deserted from the *Baltimore* May 28, 1892, and William H. Nichols, third-class apprentice, reported as having deserted from the *Baltimore* January 18, 1892, action in the cases of Quigley and Nichols being reserved for the future consideration of the Department, and with this further exception, that the Secretary of the Navy may, at any time, make such reapportionment or redistribution of any part of the said sum of $75,000 remaining undistributed as may, in his judgment, be deemed just and equitable."

From time to time, as the Department has been able to identify the parties, payments have been made to the persons named in the above list, with the exception that the disposition of the sum to which the deserters, Quigley, $1,000, and Nichols, $300, would have been entitled, has not yet been determined.

Upon making the above payments, receipts in the following form, with the necessary modification in the cases of the seamen who were killed, have been taken.

> Received ———, A. D. 1893, from the honorable Hilary A. Herbert, Secretary of the Navy, the sum of ——— dollars ($———), in payment of the amount apportioned to me by the Secretary of the Navy, upon the recommendation of the board of naval officers appointed January 3, 1893, for the purpose of considering and determining the proportionate amounts in which the sum of $75,000, presented by the Republic

of Chile, should be distributed among the seamen of the U. S. S. *Baltimore* who received personal injuries, and the families of the seamen who were killed at Valparaiso on October 16, 1891, said sum of $—— being hereby received and accepted by me in full settlement and discharge of all claims and demands against the Republic of Chile, the United States, or the Secretary of the Navy, of whatsoever kind or nature, for or on account of any and all personal injuries suffered by me in the city of Valparaiso, Republic of Chile, October 16, 1891.

$———.

——— ———.

Witnesses:

——— ———.
——— ———.

NAVAL PRISON, BOSTON, MASS.

In his annual report to the Secretary of the Navy, dated October 15, 1892, the Chief of the Bureau of Medicine and Surgery stated that certain changes and improvements in the prison at the navy-yard, Boston, Mass., were necessary in order to properly provide for the health of the prisoners therein confined.

In January, 1893, by order of the Department, I made an inspection of this prison and submitted a report, a copy of which is hereto appended. The recommendations contained in said report, that the exercise yard of the prison be enlarged, and that the precaution heretofore observed of ironing men in pairs while exercising be discontinued, have been carried into effect. In pursuance of a further recommendation made in the report, a board of officers was appointed for the purpose of preparing plans and estimates of the cost of the enlargement of the prison, which board has submitted a report presenting alternative plans, one contemplating the use of the entire space on the lower floor of the building, and the other, which is preferred by the board, contemplating the fitting of the easterly half of the second story of the building with cells for the accommodation of prisoners. The probable cost of utilizing the lower floor of the building for prison purposes, according to the first of the plans reported by the board, is estimated at $16,365, while the cost of the additions and changes necessary to adapt the second floor of the building for use as a prison is estimated at $12,544.

The prison in its present condition does not contain a sufficient number of properly lighted cells to accommodate the prisoners required to be confined at Boston, nor does it afford facilities for giving the prisoners the necessary exercise in bad weather; but if the suggestions contained in the report above mentioned for the enlargement and improvement of the prison should be carried into effect, I am of opinion that the present building can be made to answer the requirements of the service, and that the erection of a new building for the purpose will not now be necessary.

It is important that early action be taken in the matter of the improvement and enlargement of the naval prison at Boston, in view of the fact that it has recently become necessary to confine men, sentenced to imprisonment, on board receiving ships and elsewhere, because there was not room for them in the naval prison.

The system has been adopted in this office of recommending that a portion of the sentence of naval prisoners be remitted for good conduct. In cases where a man's conduct is shown to have been "good," he is usually released at the expiration of three-fourths of his term, and where a man's conduct is reported as "very good" it has been customary to recommend his release at the expiration of two-thirds of his term of confinement. In pursuance of this policy the release, prior to the expiration of their terms of confinement, of fifty-five prisoners confined at the naval prison at Boston was recommended and approved by the Department during the fiscal year, and similar action was taken in the cases of six prisoners confined in the naval prison at Mare Island, California.

NAVAL PRISON, MARE ISLAND, CALIFORNIA.

The prison at the navy-yard, Mare Island, California, is situated in a structure about 27 by 54 feet, immediately in the rear of the marine barracks. Until 1892 this was a one-story building, but in that year a second story was added. There are twelve cells on each floor, making a total capacity of twenty-four cells, all of which are situated on the inside, and are entirely surrounded by a corridor, thus making them all inside cells with iron doors, which are simply pierced with holes to afford the necessary ventilation. Leading into the corridors which surround the cells are large windows, and this is the only method of furnishing light and air to the cells. On the lower floor are situated the bath tub and water-closet.

There is no exercise yard attached to the prison. The capacity of this prison has never yet been strained, and the men in inclement weather are therefore exercised in such corridors as are unoccupied by prisoners, while in fair weather the exercise is generally taken by employing the men in work around the yard. The men's food is prepared at the barracks, the bill of fare being similar to that furnished the marines, and as no complaints on this subject have been received, it is presumed that it is satisfactory. Electric lights have recently been installed, which add very much to the comfort of the men.

Recently the Department has approved the requisition of the officer in charge of the prison for wire clothes lockers, which have been placed in the corridors surrounding the cells, and are a great convenience and comfort.

ANSWERS TO CALLS FOR INFORMATION, MADE BY THE DEPARTMENT OF JUSTICE, THE COURT OF CLAIMS, AND CONGRESS.

Section 188 of the Revised Statutes provides that in all suits brought against the United States in the Court of Claims, founded upon any contract, agreement, or transaction with any Department, or where the matter on which a claim is based has been passed upon or decided by any Department, the Attorney-General shall transmit to such Department a printed copy of the petition filed by the claimant, with a request for all facts, circumstances, and evidence touching the claim in the possession or knowledge of the Department, and a full statement, in writing, of all such facts, information, and proofs bearing upon the claim.

An important part of the business of this office is the preparation and forwarding, under the seal of the Department, of answers to calls for information respecting claims, received from the Attorney-General or the Court of Claims, under the provisions of the above section. Calls of like character are frequently received from Congress.

CONSTRUCTION OF STATUTES, NAVY REGULATIONS, AND CONTRACTS.

Questions arising in the several bureaus of the Department, or at the navy-yards or stations, respecting the construction of statutes relating to naval affairs; questions respecting the meaning and practical application of the Navy regulations, departmental orders or circulars; and questions growing out of the interpretation of contracts and the rights of bidders, sureties, contractors, laborers, and material men thereunder, when submitted to the Department for instructions or on appeal, are referred to this office for examination. For the prompt consideration and disposition of work of this character, which has increased very greatly in consequence of the numerous questions arising under contracts for the construction of new naval vessels, the services of an additional law and contract clerk in this office are urgently required, and an item providing for such additional clerk has accordingly been included in the estimates submitted for the ensuing fiscal year.

In conclusion, I have the honor to state that the above report of the operations of this office for the last fiscal year, which is submitted in compliance with the Department's letter of June 15, 1893, has been made somewhat full in view of the fact that this is the first annual report made by the Judge-Advocate-General of the Navy, and it is believed that the important character of the present work of the office is a sufficient justification for the length of the report herewith submitted.

A duplicate set of the estimates of the office for the fiscal year ending June 30, 1895, is inclosed in accordance with the further instructions contained in your letter of the 15th of June last.

Very respectfully,

SAM. C. LEMLY,
Judge-Advocate-General.

The SECRETARY OF THE NAVY.

APPENDIX.

NAVY DEPARTMENT,
OFFICE OF THE JUDGE-ADVOCATE-GENERAL,
Washington, January 31, 1893.

SIR: I have the honor to report that, in obedience to your order of the 14th instant and verbal instructions, I visited the prison at the navy-yard, Boston, Mass., on Saturday, the 23d instant, and inspected the same and its inmates. Every facility was given me by the commandant of the navy-yard, Capt. Thomas O. Selfridge, U. S. Navy, and by Maj. Percival C. Pope, U. S. Marine Corps, commanding the Marine Barracks and in immediate charge of the prison, for making my inspection thorough.

The structure in which the prison is situated is so well described in the report of the chief of the Bureau of Medicine and Surgery to the Secretary of the Navy, 1892, pp. 5, 6, that I deem it unnecessary to enter into the details of the same in this report, except to state that its present capacity is forty single cells, together with one double cell twice the size of the others, which is now used as a storeroom for the effects of the prisoners, but is intended to be available as a compartment to be occupied by sick prisoners who can not be treated in their cells. For this purpose, however, it has, I am informed, been seldom necessary to use it, and it would certainly be inadequate for more than two patients.

At present the number of prisoners, with but one in each cell, which should not be exceeded, is forty, the full capacity of the prison. Its capacity should be increased, however, not only for the purpose of accommodating a larger number of prisoners, if necessary, but also in order that an exercise room, for use in bad weather, might be made, such room to be available as a temporary hospital in case of emergency. This can be effected by utilizing the entire space on the lower floor of the building (No. 38) in which the prison is located, one-half of which is now occupied as a part of a storehouse of the Bureau of Supplies and Accounts. It is believed that the stores therein contained can be provided for elsewhere in the yard, and the chief of the Bureau of Yards and Docks, who accompanied me to Boston and to the prison during my inspection, concurs in this opinion.

The exercise yard at the end of the building can readily be enlarged so as to admit of more space for exercise during good weather, and this the chief of the Bureau of Yards and Docks states that he will cause to be done by extending the inclosure.

I have to request that this report be referred to the chief of the Bureau of Yards and Docks for remark upon so much of the same as relates to the proposed enlargement and exercise yard of the prison, and if he concurs in my recommendations, that a board be appointed to make plans and estimates of the cost of extension.

With reference to the condition of the prison, I have to report that I found it to be scrupulously neat inside and outside of the cells, in the storeroom, cooking apartment, water-closets, and bathroom, and the prisoners, speaking from the standpoint of a layman, in excellent health. I conversed with each one of the prisoners, and after reminding them that as men who are undergoing punishment for offenses of a more or less serious nature they can not expect to be treated otherwise than as prisoners, but are entitled to humane treatment and good fare, I invited them to state any cause of complaint which they desired to have submitted to the Department. Several of them deemed themselves unjustly treated, either in the manner of their conviction or by reason of the length of sentence inflicted. These were informed that their first cause of complaint was a matter already disposed of, and the second a question for future consideration, the result of which would depend largely upon the report of their conduct, and that the sentences of such of them as showed themselves deserving of clemency would, without doubt, be from time to time mitigated.

The bill of fare of the prisoners, as furnished me by Maj. Pope, is as follows:

Sunday—Breakfast: Bread, coffee, milk, corned-beef hash, baked beans. Dinner: Bread, beef soup, roast beef, gravy, tomatoes, mashed potatoes, pies. Supper: Bread, coffee, milk, rice pudding.

Monday—Breakfast: Bread, coffee, milk, beef stew. Dinner: Bread, bean soup, bacon, potatoes, pickles. Supper: Bread, coffee, milk, baked beans.

Tuesday—Breakfast: Bread, coffee, milk, mutton stew. Dinner: Bread, beef soup, roast beef, green peas, potatoes. Supper: Bread, coffee, milk, fried onions, potatoes.

Wednesday—Breakfast: Bread, coffee, milk, beef stew. Dinner: Bread, pea soup, fresh pork, mashed turnips, potatoes, pies. Supper: Bread, coffee, milk, tripe or kidney stew.

Thursday—Breakfast: Bread, coffee, milk, bacon, boiled potatoes. Dinner: Bread, beef soup, fresh beef, potatoes, plum pudding. Supper: Bread, coffee, milk, beef hash.

Friday—Breakfast: Bread, coffee, milk, mutton stew. Dinner: Bread, bean soup, bacon, boiled potatoes, pickles. Supper: Bread, coffee, milk, baked beans.

Saturday—Breakfast: Bread, coffee, milk, liver, bacon, boiled potatoes. Dinner: Bread, coffee, milk, corned beef, cabbage, boiled potatoes. Supper: Bread, tea, milk, oatmeal mush.

After inspecting the prison in the forenoon I returned at noon, when dinner was being served, and partook of the same. I found that it conformed to the bill of fare for Saturday dinner; that the food was good in quality, well cooked, and sufficient in quantity. But one of the men made any complaint with regard to the food, he stating that he thought the stew for breakfast might be varied more than at present. In the absence of complaint of the same character from other prisoners, and from an inspection of the bill of fare, I believe that this complaint was unreasonable.

The prison, I am informed, is visited from time to time by the commandant of the yard and the commanding marine officer, and by the surgeon of the yard, not only when called professionally, but at other times as well, and by the officer of the day several times daily, and is thoroughly inspected monthly by the captain of the yard. I consulted with the chaplain of the receiving ship *Wabash*, Chaplain John S. Wallace, U. S. Navy (there being no chaplain attached to the yard), in regard to the prisoners, and he has nothing to suggest in their behalf, except better facilities for exercise. Chaplain Wallace informed me that he holds divine service in the prison on Sunday afternoons, the men being released from their cells and placed in the corridors during such service.

I recommend that the apparently unnecessary precaution now observed of ironing the men in pairs while exercising in the exercise yard be discontinued, deeming it unnecessary as a precaution to prevent escape.

It is proper to state that any enlargement of the prison which may now be made should be considered in the light of a temporary expedient only, and when a sufficient appropriation can be secured for the purpose a prison should be erected in some suitable place, but in the meantime I deem the extension above recommended to be urgently needed.

Very respectfully,

SAM. C. LEMLY,
Judge-Advocate-General.

The SECRETARY OF THE NAVY.

REPORT

OF THE

SUPERINTENDENT OF NAVAL WAR RECORDS.

NAVY DEPARTMENT,
LIBRARY AND NAVAL WAR RECORDS,
Washington, August 11, 1893.

SIR: I have the honor to submit the annual report of this office, and to transmit herewith the estimates for the fiscal year 1894-'95.

Since the last report there have been added to the Department Library 1,300 volumes.

Congress cut down the appropriation for professional books and periodicals for the present fiscal year to $500. It is recommended that the estimate for this purpose be restored to $1,000, the original figure, which has been appropriated for many years past, this amount being necessary to keep up the present high professional standard of the library, as well as to supply the Naval Intelligence Office with technical and professional information.

The work of collecting and preparing for publication the Naval Records of the Civil War has been continued during the past year, and valuable additional material has been obtained.

The papers of the following prominent officers, among others, have already been collected and listed, including those of Farragut, Porter, Dupont, Goldsborough, Mervine, McKean, and Foote, on the Union side, and Buchanan, Semmes, Barron, Mitchell, Hunter, Brooke, Maffitt, and Waddell, on the Confederate side.

While the supply of documents of the Union naval commanders is very voluminous, it has been found that the Confederate matter is not as complete as could be desired. This is due to the great difficulty in collecting these papers, scattered as they are all over the country in family archives, and also for the reason that the Confederate navy department in Richmond, with its contents, was burned at the close of the war. Each year adds to this difficulty of collection, and in order that we may obtain these papers before all trace is lost it is essential that the search should be vigorously continued.

This office has been in correspondence recently with Capt. James D. Bulloch, of Liverpool, England, who was Confederate naval agent abroad during the civil war, and who has in his possession a mass of valuable material covering the outfit of the Confederate cruisers, which I trust we may be able to obtain. I am also informed that there are original Confederate archives of much value in the collection of the British Museum, and I have requested Mr. B. F. Stevens, of London, to examine these papers and inform me of their character.

We are now prepared to begin the publication of the Naval War Records, a proposed plan of which is herewith respectfully submitted. It is estimated that sufficient material is ready for two volumes of about 800 or 1,000 pages each. For the purpose of beginning this publication and providing for the cost of issuing these two volumes, an additional item of $15,000 is recommended. This estimate will permit the publication of an edition of 10,000 copies, and is based upon a careful examination of the cost of a volume of similar size of the Army War Records.

In order to place the Naval War Records in a permanent and accessible form where it can be retained as standard reference for the executive and legislative departments of the Government, and for the public generally, it is of great importance that the publication should be no longer delayed. Frequent inquiries are received in this office from different parts of the country asking for volumes of the work, which it has been impossible to supply.

Very respectfully,

RICHARD RUSH,
Superintendent Naval War Records.

The SECRETARY OF THE NAVY.

NAVAL WAR RECORDS—PROPOSED PLAN OF PUBLICATION.

The publication will be comprised in three series in the following order of arrangement:

The *first series* will embrace the reports, orders, and correspondence, both Union and Confederate, of all naval operations on the Atlantic and Gulf coasts and inland waters of the United States during the war of the rebellion, together with the operations of vessels acting singly, either as cruisers or privateers, in different parts of the world. These reports will be accompanied by such diagrams and maps as may be necessary.

In this series the papers will be arranged according to squadrons and flotillas, chronologically, and as far as possible the Union reports of any event will be immediately followed by the Confederate reports.

The second series will embrace the reports, orders, and correspondence relating to—

I. The condition of the Union Navy in 1861, before the commencement of hostilities, and to its increase during the progress of the war, including the annual and special reports of the Secretary of the Navy and chiefs of the various bureaus.

II. The construction and outfit of the Confederate navy, including privateers, setting forth also the annual and special reports of the Confederate secretary of the navy and chiefs of bureaus.

III. Statistical data of all naval vessels, Union and Confederate, as far as can be obtained.

IV. Returns of naval and military property captured by the navies of both sides during the war.

V. Returns relating to naval prisoners.

This series will be arranged chronologically in the above sections, as far as practicable.

The *third series* will embrace all reports, orders, correspondence, and returns of the Union and Confederate authorities not specially relating to the matter of the first and second series.

REPORT

OF

THE BOARD OF VISITORS

TO THE

NAVAL ACADEMY, 1893.

WASHINGTON, D. C., *June 15, 1893.*

The SECRETARY OF THE NAVY:

The Board of Visitors to the Naval Academy assembled at Annapolis on Monday, May 29, and were officially received by the Superintendent and the heads of the departments and escorted to the parade ground, where they were received by the marine guard and the battalion of cadets.

The Board then made a tour of the Academy and visited the various buildings and departments.

At 2 p. m. the Board convened and organized by the election of Senator George Gray as president, and Capt. John Wilkes as vice-president.

Lieut. Hugo Osterhaus, U. S. Navy, reported and was elected secretary of the Board.

All members of the Board were present except A. P. Morse, esq., Senator N. Dixon, Hon. A. J. Cummings, M. C., and Hon. J. H. Blount, M. C.

A resolution was adopted for the appointment by the president of the usual standing committees and also of a committee to select the orator for the graduating exercises.

The president appointed Capt. John Wilkes and Gen. John B. Castleman to select the orator.

The Secretary read a letter from the librarian of the Academy tendering the use of the library to the Board, which was acknowledged.

At 3:40 p. m. the Board adjourned.

At 6 p. m. the Board reconvened. All present except the Hon. J. B. Robinson, A. P. Morse, esq., Senator Dixon, Hon. A. J. Cummings, and Hon. J. H. Blount.

The committee on selection of an orator to address the graduating class reported that it had selected for this duty Noah Brooks, esq.

The president announced the members of the Board as follows:

Senator George Gray, Wilmington, Del., president.

Capt. John Wilkes, Charlotte, N. C., vice-president.

Senator Nathan F. Dixon, Westerly, R. I.

Hon. John B. Robinson, Media, Pa., House of Representatives.

Hon. Amos J. Cummings, New York City, N. Y., House of Representatives.

Hon. James H. Blount, Macon, Ga., House of Representatives.
Rev. J. H. Bryson, Huntsville, Ala.
James T. Woodward, esq., New York City, N. Y.
Gen. Jno. B. Castleman, Louisville, Ky.
William J. Curtis, esq., Summit, N. J.
Alexander Porter Morse, esq., Washington, D. C.
Noah Brooks, esq., Newark, N. J.

STANDING COMMITTEES.

(1) *Conditions of admission to and discharge from the Academy.*—Senator Nathan F. Dixon, Rev. J. H. Bryson, Capt. John Wilkes.

(2) *Subjects of study, and standard of scholarship.*—W. J. Curtis, esq., Rev. J. H. Bryson, Noah Brooks, esq.

(3) *Grounds, buildings, and sanitary condition.*—Hon. Amos J. Cummings, Gen. J. B. Castleman, Alexander Porter Morse, esq., James T. Woodward, esq.

(4) *Seamanship, ordnance, and navigation.*—Capt. John Wilkes, Hon. J. B. Robinson, Alexander Porter Morse, esq.

(5) *Discipline, drill, practical exercises, administration, and police.*—Gen. J. B. Castleman, Hon. N. F. Dixon, Hon. J. B. Robinson.

(6) *Steam, mathematics, physics, and mechanics.*—Hon. J. B. Robinson, Hon. A. J. Cummings, Capt. John Wilkes, W. J. Curtis, esq.

(7) *English studies, modern languages, drawing, physiology, and hygiene.*—Rev. J. H. Bryson, Noah Brooks, esq., Gen. J. B. Castleman.

(8) *Finance and library.*—James T. Woodward, esq., W. J. Curtis, esq., Hon. A. J. Cummings.

(9) *Final report.*—A. P. Morse, esq., Hon. Amos J. Cummings, Hon. N. F. Dixon, Hon. George Gray.

The Board then, at 6:30 p. m., adjourned until 12:30 p. m. to-morrow, May 30.

On May 30, at 12:45 p. m., the Board met pursuant to adjournment.

Present—Senator Gray, Capt. Wilkes, Rev. J. H. Bryson, Mr. Woodward, Mr. Curtis, Gen. Castleman.

Alexander Porter Morse, esq., of Washington, D. C., reported as a member of the Board.

A resolution inviting the Superintendent to attend its meetings was adopted.

At 1 p. m. the Board adjourned until 2:30 p. m.

At 2:30 p. m. Board reconvened.

Present—All the members except Hon. J. H. Blount, Hon. J. B. Robinson, and Hon. A. J. Cummings.

Senator N. F. Dixon reported as a member of the Board.

Capt. R. L. Phythian, U. S. Navy, Superintendent, submitted his views in regard to the Academy, and the changes which should be made.

At 3:45 p. m. Board adjourned until 12:30 p. m. to-morrow, May 31, 1893.

On May 31, at 12:30 p. m., the Board met pursuant to adjournment.

Present—All the members except the Hon. J. H. Blount, Hon. J. B. Robinson, and Hon. A. J. Cummings.

The Board discussed various matters pertaining to the Academy, and then, at 1:15 p. m., adjourned until 9 a. m., June 2.

On June 2, at 9 a. m., the Board met pursuant to adjournment.

Present—All the members except the Hon. J. H. Blount.

Reports of standing committees were received, read, discussed, and, by resolution, referred to the committee on final report.

A resolution, directing the secretary to transmit a copy of the report of the committee on grounds, buildings, and sanitary condition, was adopted.

At 10 a. m. the Board adjourned to the library to receive the honorable Secretary of the Navy, after which they attended the graduating exercises in the chapel.

At noon the Board reconvened and continued the discussion of subcommittee reports and its final report.

A resolution in regard to future Boards of Visitors was adopted.

Also a resolution in regard to referring recommendations of heads of departments in regard to future appropriations to the Board.

Also a resolution empowering the president of the Board to appoint a committee of five members to urge the adoption by Congress of the Board's recommendations.

The following committee was appointed: W. J. Curtis, esq., chairman; Gen. J. B. Castleman, Capt. John Wilkes, J. T. Woodward, esq., A. P. Morse, esq.

CONDITIONS OF ADMISSION TO AND DISCHARGE FROM THE ACADEMY.

The Board after full examination and explanation from the Superintendent, with recommendations by the Superintendent, have arrived at the following conclusions:

Appointments for admission to the Naval Academy should be upon the same basis as appointments to the Military Academy. To the accomplishment of this purpose we recommend that the Secretary of the Navy urgently press upon the attention of Congress the necessity of enacting legislation directing that the appointments to the Naval Academy be made one year in advance of the time of admission to the Academy.

The Board further recommend that the commandant of the Academy should adopt rules and regulations, subject to the approval of the Secretary of the Navy, under which cadets shall be admitted on probation of three months, in order that the conduct and general qualification of each cadet for admission may be determined.

The Board further recommend that the Secretary of the Navy urge upon Congress the passage of legislation preventing the reappointment of young men who have been dismissed, if, in his opinion, legislation is necessary to prevent such reappointment.

If, in the opinion of the Secretary of the Navy, further legislation is necessary, the Board recommend that rules should be adopted applying to dismissals, and defining explicitly what misconduct or failure in obtaining academic averages shall disqualify a person who has been discharged for reappointment.

SUBJECTS OF STUDY AND STANDARD OF SCHOLARSHIPS.

The Board have carefully considered the curriculum and diligently inquired into the methods of teaching prevailing at the Academy. They take pleasure in heartily commending the institution and its work, and believe that under the present system of instruction as much is being accomplished as lies within the power of teachers and pupils.

They urge the adoption of the recommendations respecting the ch of system, so as to provide six academic years, with more frequent [illegible] of a tical instruction upon suitable vessels to be provided by the Department. If there be any deficiency in the present system it is the small amount of practical instruction given to the cadets; but over this the present faculty of the institution have no control, although fully recognizing its defects.

Your Board take pleasure in expressing their warm appreciation of the enthusiasm, zeal, and earnestness of the officers detailed at the Academy; at the same time we feel that it would be advisable to extend the permanent corps of teachers, to be selected from any rank of life and not exclusively from the Navy, to those departments of study which are not special to the Navy, such as mathematics, history, constitutional and international law, and the English studies.

The Board further suggest the importance of an early consideration of the desirability of the consolidation of all naval schools and institutions under one management at Annapolis as conducive to economy, and tending to furnish cadets the advantages of the system, apparatus, and influence of the other schools, as well as assembling the most efficient instructors.

GROUNDS, BUILDINGS, AND SANITARY CONDITION.

The Board report the grounds are well kept, and preserve the beauty and neatness that have characterized them in former years. Nothing further has been done toward grading the new grounds, and the work of filling in on its front has stopped. The last Congress failed to make any further appropriation for the work. In its present condition this ground is an unsightly feature. The Board recommend that the work be completed as soon as the resources of the public Treasury will admit.

The grounds of the naval cemetery have been surveyed and laid out in accordance with the plans of the Superintendent. The plots and roads are marked by temporary wooden stakes. They ought to be replaced by permanent corner stones. If the footpaths and roadways were cut through and graded it would enhance the natural beauty of the cemetery.

The old naval hospital farm is used for pasturage and the cultivation of garden truck and hay. The hospital building itself, erected years ago by the use of the naval pension fund, is fast going to ruin. The great balcony is rotting and falling and the steps are unsafe. The roof is leaky, and in many rooms the plaster has fallen off, damaging the gas fixtures and valuable relics stored inside. The hospital building ought to be either removed or placed in proper repair. For all practical purposes the building and grounds, in their present state, are useless to the Government.

Two years ago an appropriation for the rebuilding of the gymnasium was made. The sum was not large enough for the building of a new gymnasium near the quarters of the cadets. The old one is therefore being reconstructed. The work of alteration is nearly completed, although the contractor is behind time in his work.

There is a swimming tank upon the ground floor, which can be filled with either fresh or salt water, warm and cold, with dressing rooms handy and every convenience and appliance for a first-class gymnasium.

The Board recommend an appropriation for either increasing the gas supply of the institution or for supplanting gas with electric lights. Steps have already been taken to improve and extend the steam-heating plant. When the new buildings are completed the present gas plant will be inadequate. It must either be enlarged or an electric plant provided to supply light for cadet quarters, gymnasium, and boathouse. The tank for storage is of brick. The walls are settling and cracking, and the gas is constantly leaking. If gas is to be used permanently an iron tank should be built.

The Board recommend additional quarters for the officers of the Academy. Quarters are assigned according to rank, and some of the junior officers are compelled to board outside the grounds. More buildings are required.

The water supply at the Academy is insufficient. All the fresh water used comes from the mains of the Annapolis City Water Company. The Government will pay for its supply from these mains during the present fiscal year $5,500. The supply is so inadequate that during the severe weather last winter all the wells and cisterns in the yard were opened. The mains were so weak that there was danger that the water from the city would be entirely shut off. In view of these facts, the Board suggest that it would be practical economy to sink an artesian well on the grounds of the Academy, or on the Government farm. From such a source the supply would be pure and ample at all times.

A far better equipment is also required for the boathouse. In 1876 a gale destroyed the boathouse and boats. Since that time very little has been done for the encouragement of the cadets in rowing. The Government owns no rowing equipment at its naval school. This singular neglect has nearly destroyed all interest in this important branch of naval education. Officers and cadets have united recently in an effort to revive this interest and to supply in some measure the equipment which the Government has failed to provide. A crew has been organized, and the school is again becoming interested in rowing contests. The scope of this private expenditure for the public good is necessarily limited. There are only shells enough to supply a very small percentage of the number of cadets. There is no equipment for general practice. Even that supplied by private means is housed in an abandoned coal shed, and the oarsmen are forced to embark for practice from a temporary and unsightly float. It is obviously the duty of the Government to provide a suitable boathouse and boats, with all necessary equipments.

The condition of the buildings on the Academy grounds is apparently satisfactory. The quarters of the cadets are clean and spacious, the mess room answers all purposes, and none of the public buildings are neglected. Additions are needed, however. Before any are made the entire plan of the Academy ought to be changed. The cadets work under a great disadvantage. Their dormitories ought to be together and their gymnasium not so far from their quarters. There are two heating plants—a gas plant and a small electric plant put up in the chemical department. It has been suggested, as a remedy, that the buildings should be grouped as they are at West Point. Such grouping would undoubtedly add greatly to the efficiency of the Academy and save in the end much money.

The Superintendent says that the best interests of the Academy demand additions to the buildings. It would probably be economical to provide for some of them as soon as possible. Before this is done the Superintendent advises a well-digested plan for permanent improvements. An entire reorganization ought to be made, but at all events the plan should be rigidly adhered to in the construction of new buildings.

To this end the Board of Visitors recommend the appointment of a commission to be selected by the Secretary of the Navy, whose duty it shall be to carefully consider the wants of the institution and to formulate a general plan for the improvement of the Academy. The order in which the improvements are to be taken up might be left for future consideration.

The general sanitary condition of the Academy seems to be good. The approach of a cholera season, however, warns us that we can not be too careful. The disposition of sewage from the marine barracks is defective. It is carried into a shallow pocket near the barracks, where it does not get the sweep of the tide. At low water the ground is bare. Pestilential germs may be disseminated unless prompt action is taken. An iron pipe is wanted to carry the sewage into deep water, where it will be swept away by the tide. The closets in the barracks also need a thorough overhauling. There is not water enough to flush them properly, and they are dangerous in a sanitary sense. There are many of the old-fashioned pan closets in use in the quarters of the officers and cadets, but they are being removed and replaced by the latest improved cascade closets as fast as the appropriations will permit. The closets for the cadets need prompt reconstruction on a new basis, and a bountiful supply of water.

The Board recommend a thorough reconstruction of the closet system, believing that a proper regard for the health of all concerned requires it.

SEAMANSHIP, ORDNANCE, AND NAVIGATION.

The Board have witnessed with pleasure the drills and other exercises coming under charge of these divisions of instruction in the Academy, and report in high terms of commendation, but regret that in consequence of bad weather, those in practical seamanship had to be omitted.

The absence of suitable vessels, for properly carrying on the important part of naval education, practical seamanship, has prevented proper instruction in this part of the course of studies, and they strongly recommend and urge the detail of vessels, sail and modern, for the sole use of the Academy.

The time given to the branch of practical seamanship is too short. Sailing vessels are, it is true, things of the past, but machinery is subject to many accidents, and at any moment the commander of a modern man-of-war may find his vessel at the mercy of the wind and waves, and should have such practical knowledge as would enable him to use those appliances of olden times, with which the Navy then did the country such good service, and themselves so much honor.

The text-books used in the seamanship department are foreign, and treat mostly of vessels not of recent type. The preparation of a text-book, for the instruction of cadets in the most modern methods of construction, our own as well as those of the advanced shipbuilders of Europe, is advised ; also such an addition to the class room of working models (in miniature), of modern vessels, men-of-war and merchant steamers, as would enable the professors to instruct by the eye as well as through the mind.

The ordnance department is well equipped with modern guns. The practice with them, both at quarters and in firing at targets, was of high efficiency, showing good instruction. The rifles used by the cadets are not of late modern type, and should be replaced by others, as soon as a decision is reached by the Navy Department in regard to the small arm to be used in the service.

The Board recommend the erection of an indoor rifle range for instruction in pistol and subcaliber rifle practice, so that the cadets can receive instruction in these practical drills during the bad weather of the winter months. We understand that steps have already been taken in this direction, which we hope will be completed at an early day.

The outdoor rifle ranges, at the proving grounds, should be improved by the erection of proper rifle butts, so that the safety of the public in their vicinity will be assured.

The department ordnance is supplied with proper tools for the repair of small arms, smaller parts of breechloading guns, and gun carriages; but the motive power for driving these tools can be improved, and, we are told, will be when the contemplated changes in the whole steam power of the Academy are carried to completion. The sooner the better.

In the department of navigation we regret that the equipment for practical instruction in this most important branch of a naval officer's education is lamentably deficient, a branch that is increasing each day in importance as a factor of safety, as faster vessels are being added to our squadrons.

Here the Board find old instruments, sextants, etc., that have been in use for twenty or thirty years; a small building, not large enough for the proper accommodation of the classes, and even this building, dignified by the name observatory, in bad repair. The Board recommend an entire new outfit of instruments used in practical navigation; a new building of sufficient size for properly teaching the parts of this branch, now necessary from the use in shipbuilding of steel and iron, which cause such deviations of the seaman's guide, the compass. The Board also advise the employment of a competent machinist, under whose care these delicate instruments should be placed, and who could at once supply the deterioration that must occur when handled by novices in their use.

The Board commend the general proficiency of the cadets in these departments with the small means in the hands of the professors in charge and hope that at a very early day the departments of seamanship and navigation may be as well supplied with proper helps for instruction in these very important branches as the ordnance department now is, or can be made at small outlay.

DISCIPLINE, DRILL, PRACTICAL EXERCISES, ADMINISTRATION, AND POLICE.

In so far as the enforcement thereof lies within the authority of the officers of the Academy, the Board find nothing adverse to report in respect of the discipline, drill, police, and administration.

The only matter as to which they care to suggest correction is in relation to liberty allowed to cadets. Social privileges should be so restricted as to forbid cadets to make social visits, either in or out of the yard during study days; and short leaves to go away from Annapolis should be absolutely discontinued, except in case of extreme emergency.

STEAM, MATHEMATICS, PHYSICS, AND MECHANICS.

The Board have no report to make other than to commend the conduct of these departments and approve of the course of studies.

Attention is called to the observatory and scientific instruments located there. The building is old, roof in bad condition, causing leakage which endangers the instruments. A new building should be built, fitted up with the newest and best instruments. The present nautical instruments are old and, having been in service a long time, it is recommended that a new observatory be built, which shall be a repository for all scientific instruments, sextants, chronometers, compass compensating apparatus, and that a skilled mechanician of some scientific attainment be placed in charge with adequate salary. At present all the valuable scientific plant in the old observatory is looked after by a laborer, unacquainted with the proper handling or ordinary repair of delicate instruments, such as are now stored in the observatory building.

ENGLISH STUDIES, MODERN LANGUAGES, DRAWING, PHYSIOLOGY, AND HYGIENE.

The Board have had a free and full conference with the several professors who have charge of the course of instruction in these departments; the methods of teaching, text-books, and improvements in lines of study were all considered, and the following detailed report is submitted:

(1) In the department of English studies it would be desirable for various reasons to enlarge the course of study on one or two subjects, but the Board see no way to accomplish this without taking from the time allotted to equally important studies.

(2) The course of study in the modern languages is as effective as can be made without a longer period at the Academy. It is the conviction of your Board that the study of the Spanish language should be made compulsory, and no longer optional, as it now is.

(3) The department of drawing is well adjusted in its several sections, and gives the best opportunities to the student with the present curriculum of study maintained in the institution.

(4) The department of physiology and hygiene is much cramped for time to give the results which are so desirable in this course of instruction. The importance of the instruction and physical culture obtained in this department can scarcely be overestimated.

The professor having charge of this course of instruction is urgent for more time, and the enlargement of the apparatus needed to make the course what it ought to be. But manifestly there is no way to give more time to this most important course of instruction unless there shall be some enlargement of the academic period.

In these several departments the professors painfully realize that they are prevented from doing the effective work they desire, because of the limited time the student can give their respective courses. But unless the academic period is lengthened it would be unwise to enlarge the course of instruction in any of these departments, as the time of the student should have an equitable distribution in all the academic courses.

FINANCE AND LIBRARY.

The Board refer to the communication of the Superintendent on the subject of appropriations, and recommend a regular appropriation for the next fiscal year of the same amount as the last.

So far as the Board have been able to observe, the appropriations heretofore made have been prudently and intelligently expended.

The librarian recommends a reform in the binding of books; he asks for an appropriation of $1,000 for this purpose. The Board, while not deeming this necessary, recommend that the Naval Academy, in the matter of bookbinding, be placed on a level with the Surgeon-General's Office, the Patent Office, and the library of the State Department, under the law as it now stands. The style of binding in the Naval Academy is limited to half-sheep or cloth. Such binding is not durable and is unworthy of a permanent collection of books. Morocco, even at the increase of price, is cheaper because more enduring. The Board strongly recommend that this library be placed among the unrestricted libraries. The Board also recommend legislation, if necessary, by which magazines, pamphlets, and all works of importance in naval science may be promptly bound and placed on the shelves of the library, where the officers and cadets can glean the information desired.

The Board call attention to the fact that valuable portraits of Commodores Decatur, Bainbridge, Barron, Stewart, Perry, Wilkes, and other heroes of the American Navy are now stored in the hospital building outside of the grounds, and going to destruction; also engravings of prominent naval battles, and of ships renowned in American history.

The collection includes portraits of Washington, Jefferson, Madison, Jackson, and others, and autograph letters from John Quincy Adams, James Monroe, and other distinguished Americans.

The Board recommend that proper steps be taken for the preservation of this collection, and of the paintings in the library.

The collection in the hospital came from the old naval lyceum in the Brooklyn navy-yard, and should either be preserved or given to some patriotic society who will preserve them.

The Board gratefully acknowledges the courtesy of the Superintendent and all the professors in charge in giving them every assistance that could be asked for, and only regret the short time allowed for ascertaining the conditions of the several departments reported on.

At the session of the Board, June 2, 1893, the following resolutions were adopted:

(1) *Resolved*, That the President be, and he hereby is, empowered to appoint a committee of five members of the Board, who shall be authorized, after consultation with the Secretary of the Navy, to appear before the Naval Committees of Congress on behalf of the Board to urge the adoption of its recommendations by the passage of appropriate legislation; and said committee shall also be authorized to request the Secretary of the Navy to give such attention to the changes suggested by the Board in the system of instruction at the Academy.

(2) *Resolved*, That the Board recommend an amendment of the law controlling the appointment of future Boards of Visitors, so that their term of office shall be for one year, and requiring them to make two official visits to the Academy—one during the academic year, and the other at the annual graduation exercises at the end of the academic year—and also an inspection and examination of the naval establishment at Newport, R. I.

(3) *Resolved*, That all recommendations of heads of departments for appropriations should hereafter be made to the Board through the Superintendent.

IN CONCLUSION.

The Board desires to express the great gratification which has been experienced in the discharge of the duties incident to their appointment. The Naval Academy, as presently organized and conducted, is an honor to the nation and a credit to all those who have in any way contributed to its development. Recurrent international obligations and relations involve the necessity of maintaining a well-officered and appropriately equipped naval establishment. The Navy is an institution in which every intelligent American citizen must feel a peculiar interest and pride. The old Navy was the glory of the country in the days that are gone; the reconstructed Navy should be equally the object of the solicitude and pride of the people for the present and in the future. All the lessons of experience, as well as a patriotic impulse, demand that a proper solicitude should be exercised for the education and training of the youth enlisted in this important branch of the public service. It is the character of the personnel of a service which determines its strength or weakness.

RECOMMENDATIONS.

I.

After a careful and diligent inquiry into the conditions and needs of the Naval Academy, the Board very earnestly urge the following changes in the course of instruction of naval cadets:

(1) The standard of admission to the Academy should be lowered in certain respects, and some of the branches upon which candidates are now examined should be taught during the first year.

(2) Candidates should be admitted about June 1, and after admission should remain at the Academy during part of the summer.

(3) The cruise of the cadets after the four years' course at the Academy should be discontinued, and the entire cadet course, six years, should be at the Academy, and in practice ships connected with the Academy.

(4) The present four years' course (without material addition to the studies) should be spread over six years, with longer periods allotted to practice cruises, and more professional instruction.

(5) *The third and fifth classes should have practical work at the Academy from May 22 to July 15; they should then have leave until 5th of October, two months and twenty days, and no leaves should be granted to other classes.

(6)* Four classes, first, second, fourth, and sixth, should make a four and a half months' practice cruise (June, July, August, and September, and eight days each in May and October).

(7) *The practice ships should have a commanding officer, an executive, and two instructors, and the ships should be otherwise officered by cadets of the first and second classes, who will perform the duties of navigator (under the supervision of an instructor) and the duties of watch and division officers. (See note.)

The main reason for the reduction of the standard of admission as recommended in paragraph 1, as above, is, that this change will guarantee strict justice to candidates who have not had fair facilities for preparation, and will give to representatives of all sections of the country equal chances for admission. It will break up the pernicious system of "cramming" for a special examination, by means of which many indifferent applicants, with but a superficial knowledge of the several branches, gain admission into the Academy; and for lack of which many naturally intelligent youths, whose opportunities have been limited, are now rejected.

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* The numbers of the current year are used in designating classes.

The subjects or parts of subjects omitted from the examination for admission as now prescribed will be taught during the first year, so that proficiency in them will be assured, and will be determined by the student's progress under the system of instruction pursued at the Academy. The deficient cadets will then be dropped and the efficient retained, after an intelligent weighing of their capabilities, not after an examination, the result of which depends largely upon chance, and which does not show the real proficiency of the candidates.

II.

The Board respectfully invite the attention of the Secretary of the Navy to the advantage of the appointment of a commission of experts, to be composed of United States naval officers and other eminent teachers or instructors, to obtain an exhaustive report upon possible and practicable reforms and improvements in matters of detail in the curriculum and the academic course of the Naval Academy.

GEO. GRAY,
President.

ALEXANDER PORTER MORSE,
Chairman of Committee on Final Report.

REPORT

OF THE

CHIEF OF THE BUREAU OF YARDS AND DOCKS.

BUREAU OF YARDS AND DOCKS,
NAVY DEPARTMENT,
Washington, D. C., September 30, 1893.

SIR: I have the honor to submit the following report of the Bureau of Yards and Docks for the fiscal year ending June 30, 1893.

The estimates for the Bureau for this period were—

Repairs and preservation	$500,000.00
General maintenance	500,000.00
Civil establishment	70,658.14
Improvements	1,187,270.00
Total	2,257,928.14

Congress only appropriated the following:

Repairs and preservation	$275,000.00
General maintenance	230,000.00
Civil establishment	61.494.54
Improvements	470,244.00
Total	1,036,738.54

With this reduced sum it has been my constant endeavor to keep the various navy-yards and stations in a state of efficiency. The sums appropriated are insufficient to avert entirely the decay and deterioration, and unless larger amounts are given in the future the Government will suffer great loss by reason of some of its buildings and works being beyond repair.

In my first annual report I said, and which I repeat—

> It must be borne in mind that though many of the navy-yards are closed, and thereby the expenses of the Navy in general much reduced, the Bureau of Yards and Docks is still charged with keeping them in repair.
>
> The deterioration upon an unoccupied building or dock is as great, or greater, than when occupied. If these yards and stations are never to be used for naval purposes true economy would be to sell them. If, however, the Government is to hold on to them for an emergency, sound policy requires they should be kept in repair.

There are now 13 navy-yards and stations, exclusive of the naval home, containing 445 buildings, storehouses, and workshops; 10 dry-docks, 19 railways and launching ways, 35 derricks, cranes and sheers, 4 electric plants, many miles of railroads, of wharves, of gas and water pipes.

As long as the Government keeps these this Bureau is at the same expense to maintain them, whether there is any work going on in them or not.

The new dry docks at Port Royal and Puget Sound are progressing favorably. It has been deemed advisable to make certain changes advantageous to the Government in that at Port Royal. This, together with the destruction by the recent hurricane, will delay its completion about a year. The unusually severe winter delayed the commencement of the work on the dock at New York, as well as the refusal, for a time, of the contractor to sign an agreement for its enlargement. Now, however, there is reason to believe that all will progress satisfactorily and the work completed without further delay.

Immense traveling cranes have been installed at the New York and Norfolk navy-yards. A contract has been awarded for one for the Mare Island yard. Another will be asked for for the League Island navy-yard.

These cranes are necessary to handle armor and other heavy weights for the new ships.

There is a great necessity for increased coaling facilities at the navy-yards. It is recommended that a coaling pier be built at the New York navy-yard, the cost of which to be defrayed from money received from the sale of land to the city of Brooklyn.

At Key West it is very important that a coaling pier be constructed.

I renew my former recommendations for the reorganization of the corps of civil engineers, having for its object the increase of its numbers sufficiently to place the construction and maintenance of all the public works pertaining to this Bureau under officers skilled in them, and the selection of its members from graduates of the Naval Academy who have completed a course in civil engineering.

UNITED STATES NAVAL HOME.

The history of the Home during the year has been without marked change. On July 1, 1893, the names of 205 beneficiaries were borne on the rolls, 12 had died during the past twelve months, and 14 had been dropped or dismissed from the institution.

Under the able management of Commodore Oscar F. Stanton, U. S. Navy, the high character of the Home for contentment and happiness has been maintained and the discipline has been eminently satisfactory.

The requirements of the naval service necessitated a change in the governors at the end of the fiscal year, but the new governor, Commodore E. E. Potter, U. S. Navy, starts his term with the experience gained by a previous detail at the Home, and the interests of the inmates will be well cared for.

The small tract of land, about 4 acres, cut off from the Naval Home reservation by the Schuylkill River East Side Railroad Company, has not yet been sold, although repeatedly recommended. The effect of the act of Congress of 1885, giving the aforesaid railroad the right of way through the reservation, separated this piece of land from the main grounds, and since then it has been of little benefit to the inmates of the Home.

I would earnestly recommend that this land be sold and the proceeds be used in erecting suitable buildings to add to the comfort and amusement of the beneficiaries.

A recreation hall is suggested by the Bureau as being the most suitable disposition of the funds, and by its erection the greatest enjoyment would be obtained by the inmates of the Home.

The estimates submitted by the commandants of the navy-yards and stations for the next fiscal year are:

Repairs and preservation	$712,358.62
General maintenance	451,208.00
Civil establishment	96,818.37
Improvements	7,307,176.67
Total	8,567,561.66

The estimates of the Bureau for the same period are as follows:

Sheet No. 1, Bureau (salaries)		$10,980.00
Sheet No. 2, maintenance and contingent		415,000.00
Sheet No. 2, repairs and preservation		500,000.00
Sheet No. 3, Naval Home		77,315.00
Sheet No. 4, improvements, viz:		
Boston, Mass.:		
For an electric-light plant	$15,000.00	
Brooklyn, N. Y.:		
For caisson for granite dock	35,000.00	
For railroad for transportation of boilers	14,200.00	
For renewing buildings Nos. 114, 115, and 116 (C. & R.)	70,000.00	
For grading, paving, and laying of sewers	20,000.00	
For quay wall inside of Whitney Basin	50,000.00	
For addition to commandant's house	16,000.00	
League Island, Pa.:		
For protection wall	30,000.00	
For two new officers' quarters	20,000.00	
For cranes	15,000.00	
For completion of shear legs	11,900.00	
For an electric-light plant	10,000.00	
To complete east dry-dock pier (partially appropriated for)	40,000.00	
Washington, D. C.:		
For extension of yard wall through marsh	24,693.00	
For retaining wall for and raising lower floor storehouse No. 10	10,915.00	
For installing incandescent electric light in officers' quarters and offices in yard	8,832.00	
For locomotive, wrecking train	7,500.00	
For landing platform and ship for barge	6,000.00	
For completing conversion of mold-loft building into forge shop	6,936.00	
Norfolk, Va.:		
For extension of quay wall	30,000.00	
For extension of electric plant	8,000.00	
For sewers, drains, and water-closets, etc., in offices and shops	15,000.00	
For continuing quay wall	20,000.00	
For commencing conversion of timber basin into a fitting out and repairing basin	50,000.00	
Port Royal, S. C.:		
For repairs to main wharf	18,368.00	
For purchase of adjoining property	20,000.00	
Mare Island, Cal.:		
For continuation of quay wall	30,000.00	
For moving back ferry slip	65,393.00	
For extending yard railroad	18,332.00	
For navy-yard roads	10,000.00	
For shed over galvanizing plant (C. & R)	3,750.00	
For cottage for electrician	1,937.00	
For navy-yard chapel	8,000.00	
Port Orchard, Wash.:		
For two officers' quarters	23,000.00	
For artesian well	3,500.00	
Key West.:		
For purchase of Mallory lot	20,000.00	
For iron coaling wharf	30,000.00	
For coaling shed	25,000.00	
		812,256.00
Sheet No. 5, civil establishment		66,150.79
Total		1,882,701.79

The statement showing the amount expended under each specific head of appropriation during the fiscal year ending June 30, 1893, and the balance remaining unexpended June 30, as required by section 429, Revised Statutes, is appended.

Accompanying this report is an abstract of offers for special objects of improvement and supplies coming under the cognizance of the Bureau of Yards and Docks, made in conformity to act of Congress approved March 3, 1843.

Also a report showing the amount expended during the fiscal year ending June 30, 1893, from appropriations pertaining to this Bureau for civilians employed on clerical duty or in any other capacity than as ordinary mechanics and workingmen at the several navy-yards, with estimates for the same, for the fiscal year ending June 30, 1895, in compliance with the third section of naval appropriation act approved January 30, 1885, Vol. 23, U. S. Statutes at Large, page 295.

Very respectfully, your obedient servant,

N. H. FARQUHAR,
Chief of Bureau.

The SECRETARY OF THE NAVY.

No. 1.—*Report of expenditures at navy-yards, stations, and Naval Home for the year ending June 30, 1893.*

Yards and stations.	Appropriations.					
	Yard improvements and Naval Home.	Repairs and preservation.	General maintenance.	Civil establishment.	Contingent.	**Total.**
Portsmouth, N. H	$12,016.09	$18,555.01	$21,697.53	$7,138.25	....	**$59,406.88**
Boston, Mass	6,328.20	25,088.18	24,271.44	5,376.08	$225.00	**64,288.90**
New London, Conn	....	1,319.65	6,515.99	....	....	**7,835.64**
New York, N. Y	155,899.64	64,846.56	53,622.06	15,842.03	12 073.03	**302,283.32**
League Island, Pa	113,208.73	23,816.79	16,934.48	4,157.95	999.93	**159,117.88**
Washington, D. C	25,064.61	28,920.33	17,374.45	4,269.75	10.00	**75,645.14**
Norfolk, Va	34,144.46	47,949.47	37,484.69	8,186.99	....	**127,765.61**
Pensacola, Fla	....	8,332.39	11,397.17	1,930.00	....	**21,659.56**
Mare Island, Cal	37,852.47	39,838.85	38,905.84	12,236.15	359.87	**129,193.18**
Sacketts Harbor, N. Y	....	....	219.60	365.00	33.00	**617.60**
Key West, Fla	....	1,897.49	1,776.18	600.00	....	**4,273.67**
Naval Home, Pa	67,181.64	....	....	....	....	**67,181.64**
Wharf at Erie, Pa	....	....	50.00	....	500.00	**550.00**
Port Royal, S. C	116,204.86	9,743.36	4,617.04	....	....	**130,565.26**
Puget Sound, Wash	50,228.95	....	3,892.58	....	....	**54,121.53**
Total	618,129.65	273,314.08	238,759.05	60,102.20	14,200.83	**1,204,505.81**

No. 2.—*Detailed report from navy-yards and stations of expenditures under "Repairs and Preservation" during the fiscal year ending June 30, 1893.*

Objects.	Portsmouth.	Boston.	New London.	New York.	League Island.	Washington.
Yard buildings	$3,550.33	$14,181.22	$5.61	$27,786.45	$9,974.35	$13,686.12
Officers' quarters	814.58	1,943.92	705.79	1,650.02	3,552.44	3,645.54
Wharves, bridges, landings, and boats	88.61	944.61	77.00	5,005.56	459.47	117.70
Roads, walks, gutters, and drains	3,267.12	5,008.20	218.25	4,902.22	1,572.88	2,276.71
Fences and walls	23.30	231.62	12.00	464.43	361.43	381.23
Cranes, scows, and derricks	175.04	....	....	1,507.01	28.28	99.37
Furnaces, forges, heating apparatus, etc	589.80	2,250.39	....	2,104.36	180.87	4,159.25
Tracks and scales	756.38	658.04	....	8,442.50	....	2,467.84
Water, gas, and electric light works	18.04	1,355.21	6.00	3,200.92	1,186.34	1,471.16
Dredging and scowing	....	....	....	210.52	23.90	....
Dry docks	402.85	835.10	....	5,449.13	2,234.34	....
Miscellaneous repairs	3,243.71	272.73	295.00	4,123.44	3,296.31	167.65
Coal	....	407.14	....	....	....	....
Holidays	218.48	....	....	....	....	453.76
Cleaning and walling pond	999.90	....	....	....	....	....
Floor, etc., building 45.46	3,872.08	....	....	....	....	....
Repair to reservoir	253.70	....	....	....	....	....
Hospital sewer, Seaveys Island	281.00	....	....	....	....	....
Machinery	....	....	....	....	946.18	....
Total	18,555.01	28,088.18	1,319.65	64,846.56	23,816.79	28,926.33

Objects.	Norfolk.	Pensacola.	Mare Island.	Key West.	Port Royal.	Total.
Yard buildings	$9,956.75	$1,762.96	$6,069.54	....	$1,450.14	$88,423.47
Officers' quarters	770.41	618.06	13,713.21	$55.43	4,701.27	32,170.67
Wharves, bridges, landings, and boats	3,819.46	1,339.49	765.61	64.26	166.48	12,848.25
Roads, walks, gutters, and drains	3,571.06	608.48	4,136.33	332.00	1,268.70	27,161.95
Fences and walls	497.72	501.62	810.62	....	181.21	3,465.18
Cranes, scows, and derricks	5,070.61	31.20	531.01	....	....	7,442.52
Furnaces, forges, heating apparatus, etc	454.30	209.78	3,930.87	....	93.80	13,973.51
Tracks and scales	104.92	....	79.73	....	....	12,509.41
Water, gas, and electric light works	1,606.56	809.90	2,649.08	....	1,802.51	14,165.72
Dredging and scowing	....	....	103.38	....	....	337.80
Dry docks	8,261.54	126.83	2,218.82	12.60	....	19,541.21
Miscellaneous repairs	13,836.14	2,190.63	4,830.65	1,433.20	19.25	33,708.71
Coal	....	....	....	....	....	407.14
Holidays	....	133.44	....	....	....	805.68
Cleaning and walling pond	....	....	....	....	....	999.90
Floor, etc., building 45.46	....	....	....	....	....	3,872.08
Repair to reservoir	....	....	....	....	....	253.70
Hospital sewer, Seaveys Island	....	....	....	....	....	281.00
Machinery	....	....	....	....	....	946.18
Total	47,949.47	8,332.39	39,838.85	1,897.49	9,743.36	273,314.08

No. 3.—*Detailed report of expenditures under "General Maintenance" received from yards and stations during the fiscal year ending June 30, 1893.*

Objects.	Portsmouth.	Boston.	New London.	New York.	League Island.	Washington.	Norfolk.
Freight and transportation				$25.11			
Printing, stationery, and advertising	$325.09	$286.31	$102.87	1,678.79	$335.89	$185.08	$429.43
Books, maps, models, and drawings		813.15		158.82	6.50		807.92
Purchase and repair of fire engines and apparatus				50.40	1,321.05		796.11
Machinery of every description and patent rights		41.63	49.00	285.39	40.76	12.44	3,549.25
Repairs on steam engines and attendance on same			60.00	4,709.89			192.62
Purchase and maintenance of oxen and horses, pay of hired teams, etc	4,041.13	4,553.02	1,349.79	8,290.39	4,770.02	3,907.53	3,417.09
Carts, timber wheels, and tools of every description	521.60	1,539.98		1,530.22	479.55	1,361.42	2,098.31
Postage on letters on public service, telegrams, and telephones	94.00	4.00	185.00	8.00	20.42	18.62	
Furniture for Government houses and offices in navy-yards	869.03	988.08	52.00	2,794.70	3,434.37	2,287.04	1,622.46
Coal and other fuel	2,374.14	3,115.81	139.12	4,869.62	1,331.70	1,442.70	4,873.87
Candles, oil, gas, and electric lights	1,411.09	457.12	14.47	3,611.02	204.01	1,050.14	4,901.77
Cleaning and clearing up yards and care of buildings	1,995.00	4,053.76	1,065.24	6,950.74	1,020.16	5,213.24	215.87
Attendance on fires, lights, fire engines, and apparatus	2,671.02	1,143.32		5,027.20	2,483.05	43.99	1,270.18
Incidental labor, not chargeable to other appropriations	2,839.36	323.27	1,208.50	194.90	35.00	1,317.46	1,893.28
Water tax and ice		2,820.85		6,108.55			223.89
Tolls and ferriage				120.00			88.75
Pay of watchmen	3,881.20	4,015.00	2,190.00	7,089.50			11,534.00
Flags, awnings, and packing boxes	45.35	116.14		118.82	1,452.00	301.47	70.39
Rent of landings			100.00				
Rent of officers' quarters, Philadelphia, Pa					2,800.00		
Miscellaneous supplies							
Casting retorts	6.08						
Holiday	223.44					233.32	
Transfer of coal, Seaveys Island	400.00						
Total	21,697.53	24,271.44	6,515.99	53,622.06	19,734.48	17,374.45	37,484.69

Objects.	Pensacola.	Mare Island.	Key West.	Sackets Harbor and Erie.	Port Royal.	Puget Sound.	Total.
Freight and transportation	$65.62	$1,376.85	$31.00			$1.00	$1,499.58
Printing, stationery, and advertising	116.61	938.06	19.91		$128.85	59.97	4,006.86
Books, maps, models, and drawings							1,786.39
Purchase and repair of fire engines and apparatus	319.32	452.71	21.00		179.00		3,142.59
Machinery of every description and patent rights	48.91						4,027.38
Repairs on steam engines and attendance on same	758.25	15.36					5,736.12
Purchase and maintenance of oxen and horses, pay of hired teams, etc	1,387.28	8,020.93			758.59		40,495.77
Carts, timber wheels, and tools of every description	516.80	1,878.18	149.65		85.77	7.05	10,168.53
Postage on letters on public service, telegrams, and telephones		3,499.56	12.00				
Furniture for Government houses and offices in navy-yards	101.59	1,613.21					
Coal and other fuel	178.06	335.15					
Candles, oil, gas, and electric lights	183.91	747.00	[illegible]				
Cleaning and clearing up yards and care of buildings	588.60	3,927.49					

No. 3.—*Detailed report of expenditures under "General Maintenance" etc.*—Continued.

Object.	Pensacola.	Mare Island.	Key West.	Sackets Harbor and Erie.	Port Royal.	Puget Sound.	Total.
Attendance on fires, lights, fire engines, and apparatus	$1,430.16	$6,666.92			$210.00		$20,945.84
Incidental labor, not chargeable to other appropriations	76.00	228.75			257.33	$3,118.00	11,491.85
Water tax and ice	196.00	4,196.03	$120.76		264.00		13,930.08
Tolls and ferriage	60.00	2,660.68			280.00		3,209.43
Pay of watchmen	5,314.40	2,204.60	1,395.00				37,623.70
Flags, awnings, and packing boxes	55.66	144.36	8.84		69.89		2,382.92
Rent of landings							100.00
Rent of officers' quarters, Philadelphia, Pa							2,800.00
Miscellaneous supplies			2.52	$269.60	661.16		933.28
Casting retorts							6.08
Holiday							456.76
Transfer of coal, Seaveys Island							400.00
Total	11,397.17	38,905.84	1,776.18	269.60	4,617.04	3,892.58	241,559.05

No. 4.—*Estimates received from navy-yards, stations, and naval asylum for fiscal year ending June 30, 1895.*

Yards and stations.	Appropriations.				
	Yard improvements.	Repairs and preservation.	General maintenance.	Civil establishment.	Total.
Portsmouth, N. H	$290,000.00	$67,000.00	$29,700.00	$8,315.25	$395,015.25
Boston, Mass	72,000.00	30,250.00	28,950.00	7,424.25	138,624.25
New London, Conn		1,330.00	6,635.00		7,965.00
New York, N. Y	1,788,661.92	278,574.16	95,817.50	23,363.75	2,186,417.33
League Island, Pennsylvania	1,331,040.33	39,204.90	37,760.00	4,278.00	1,412,283.23
Washington, D. C	71,686.58	30,100.00	21,245.00	5,301.25	128,332.83
Norfolk, Va	1,167,950.00	84,500.00	87,965.00	11,123.63	1,351,538.63
Pensacola, Fla		58,438.17	16,533.52	2,480.00	77,451.69
Mare Island, California	1,357,807.05	110,925.64	91,246.48	23,443.79	1,583,422.96
Sackets Harbor, N. Y		340.00		365.00	705.00
Key West, Fla	675,000.00	3,995.75	2,705.50	600.00	682,301.25
Naval Home, Pennsylvania	66,450.00				66,450.00
Port Royal, S. C	158,484.94	7,700.00	17,750.00	6,141.20	190,076.14
Puget Sound, Washigton	328,095.85		14,900.00	3,982.25	346,978.10
Total	7,307,176.67	712,858.62	451,208.00	96,818.37	8,567,561.66

No. 5.—*Detailed estimates from yards and stations for works of improvement for the fiscal year ending June 30, 1895.*

Yards, stations, and objects.	Estimates.	Total.
PORTSMOUTH, N. H.		
Timber dry dock, for first year	$200,000.00	
Repair to ship houses Nos. 4, 5, and 53	15,000.00	
Naval prison	75,000.00	$290,000.00
BOSTON, MASS.		
Completing steel shears	32,000.00	
Electric lighting	15,000.00	
Rebuilding wharves	25,000.00	72,000.00
BROOKLYN, N. Y.		
Caisson for granite dock	35,000.00	
Boiler pumps	40,000.00	
Railroad for heavy boilers	14,200.00	
Extending boiler, copper, and blacksmith shops, building No. 28	102,846.73	
C. & R. machine shop to replace building No. 115	70,800.00	
Grading, paving, and laying sewer	94,031.00	

No. 5.—*Detailed estimates from yards and stations, etc.*—Continued.

Yards, stations, and objects.	Estimates.	Total.
BROOKLYN, N. Y—continued.		
Sand street gate house	$40,000.00	
Quay wall from landing line northwest to granite dock	128,739.25	
Navy-yard wall along new boundary line	38,200.00	
Extension S. & A. storehouse No. 33	58,789.00	
C. & R. workshop between timber docks, building No. 27	85,240.00	
C. & R. shipwrights, shed, building No. 44	6,534.08	
Pier across Wallabout channel	120,000.00	
Causeway across Wallabout channel	98,000.00	
Quay wall inside Whitney basin	154,791.00	
Extension of railroad system	27,293.00	
Pier in East River at cob-dock	98,342.86	
C. & R. shop to replace building No. 116	60,555.00	
Dredging Whitney basin	55,000.00	
Addition to commandant's house	16,000.00	
Quay wall, cob-dock	123,500.00	
C. & R. building to replace building No. 114	70,800.00	
Barracks and recruiting station on cob-dock	250,000.00	
		$1,788,661.92
LEAGUE ISLAND YARD.		
West wall of causeway, 1,370 feet	135,630.00	
Three building slips, at $35,000	105,000.00	
Plate bending shop (C. & R.), 100 feet	75,000.00	
220-foot sea wall, west dry-dock pier to proposed building slips	20,900.00	
Pier near building slips	135,000.00	
Four new officers' quarters	60,000.00	
Two 20-ton and four 12-ton cranes	25,000.00	
Foundation for cranes	7,500.00	
2,900-foot protection wall from site of new building slips to lower end of island	36,365.00	
Sidewalks	9,100.00	
Crane scow (45-ton capacity)	10,000.00	
Floating pile-driver	5,500.00	
Two dock scows, at $2,000	4,000.00	
Mud scow	5,000.00	
Commandant's office	53,735.59	
Railroad tracks	18,409.74	
Completion of shear legs	11,900.00	
Traveling crane around dry dock	50,000.00	
Roads	15,000 00	
Removing old cribs and dredging west of west dry-dock pier and in front of new sea wall	20,000.00	
Electric lighting	10,000.00	
Ship-fitting shop	58,000.00	
Smitheries	310,000.00	
Boat shop and mold loft	150,000.00	
		1,331 040.33
WASHINGTON, D. C.		
Extension of yard wall	24,693.00	
Retaining wall for and raising lower floor store No. 10	10,915.28	
Installation of incandescent electric lights in officers' quarters	8,832.00	
New improved standard fire hydrants	1,560.00	
Conversion of south end of upper floor of sail-loft building into seamen's quarters	2,000.00	
Locomotive wrecking crane of 30,000 pounds capacity	7,500.00	
Extension of yard railroad tracks to store No. 2	3,250.00	
Construction of landing platform and slip for barge	6,000.00	
Converting mold-loft building into a forge shop	6,936.30	
		71,686.58
NORFOLK YARD, VIRGINIA.		
New ship-fitting shop	215,200.00	
Extension of quay wall	100,000.00	
Wharf south of dry dock	43,500.00	
Extension of electric plant	16,000.00	
Sewer drains and water-closets in offices and shops	25,000.00	
Repairs to granite dock	25,000.00	
Toward converting timber basin into fitting and repairing basin	100,000.00	
New dry dock	600,000.00	
One crane scow (45-ton capacity)	10,000.00	
One deck scow	2,000.00	
One sand lighter	2,000.00	
One derrick car	1,000.00	
Store shed between dry docks	18,750.00	
One 20-ton yard locomotive	6,000.00	
One 10-ton traveling crane	3,500.00	
		1,167,950.00

No. 5.—*Detailed estimates from yards and stations, etc.*—Continued.

Yards, stations, and objects.	Estimates.	Total.
PORT ROYAL, S. C.		
Protection wings to cofferdam	$21,869.80	
Crib for main wharf	13,362.06	
Repairs to wharf	5,006.08	
Roadways	8,413.63	
Purchase of property	20,000.00	
Extension of fire-hydrant system	1,534.67	
Storage cisterns	3,169.65	
Chemical engine	650.00	
Flushing tanks	266.57	
Hospital	3,200.00	
Artesian well	75,000.00	
Boundary fence	1,190.67	
Lightening rods	478.88	
Preservation of dock (tarring)	342.93	
Grading and drainage	4,000.00	$158,484.94
KEY WEST, FLA.		
Purchase of Mallory lot	20,000.00	
Iron coaling wharf	30,000.00	
Coal shed (4,000 tons capacity)	25,000.00	
Floating dry dock	600,000.00	675,000.00
MARE ISLAND, CAL.		
Extension of quay wall to coal shed	88,305.80	
Quay wall between ferry slip and stone dock	52,793.48	
Two 12-ton pillar wharf cranes	8,068.40	
Free bridge between Valligo and navy-yard	205,060.00	
Moving back ferry slip	65,393.00	
Pointing stone dock, guard chain about same, macadamizing about dock	36,659.37	
New dry dock	700,000.00	
Extension of yard railroad	18,332.61	
Railroad scales	1,640.43	
Yard roads	20,077.14	
Road to cemetery, magazine, etc	17,500.00	
Renewing board sidewalks	5,684.22	
Fences	13,965.00	
Artesian well	30,000.00	
Coal shed for yards and docks	8,395.00	
Coal shed for equipment	25,713.05	
Coal shed for steam engineering	2,138.58	
Ship-fitters' shed	30,000.00	
Shed over galvanizing plant (C. & R)	3,757.53	
Cottage for electrician	1,937.47	
Yard chapel	8,000.00	
Dispensary and medical storehouse	14,385.07	1,357,807.05
PUGET SOUND STATION, WASHINGTON.		
Wharf at dry dock	145,626.83	
Shop at dry dock	109,899.02	
Dredging at dry dock	33,750.00	
Two officers' quarters	23,000.00	
Artesian well	8,500.00	
Clearing site of station	12,320.00	328,095.85
NAVAL HOME, PA		66,450.00
Grand total		7,307,176.67

No. 6.—*Detailed estimates from navy-yards and stations for "repairs and preservation" for the fiscal year ending June 30, 1895.*

Object.	Portsmouth.	Boston.	New London.	New York.	League Island.	Washington.
Yard buildings	$25,000.00	$12,000.00	$100.00	$129,182.66	$16,566.90	$6,000.00
Officers' quarters	2,500.00	2,500.00	300.00	6,522.00	....	3,000.00
Wharves, bridges, landings, and boats	5,000.00	1,000.00	250.00	12,830.00	....	250.00
Roads, walks, gutters, and drains	1,500.00	5,000.00	250.00	51,640.00	....	5,000.00
Fences and walls	2,000.00	250.00	25.00	1,000.00	870.00	100.00
Cranes, scows, and derricks	3,000.00	500.00	25.00	14,090.00	910.00	200.00
Furnaces, forges, heating apparatus, etc	2,000.00	2,500.00	50.00	7,353.00	558.00	4,500.00
Tracks and scales	....	500.00	....	1,689.00	800.00	6,000.00
Water, gas, and electric light works	1,000.00	1,500.00	30.00	4,240.00	....	5,000.00
Dredging and scowing	....	....	....	40,000.00	....	....
Dry docks	20,000.00	2,000.00	....	2,827.50	....	....
Miscellaneous repairs	5,000.00	2,500.00	300.00	7,200.00	....	50.00
Dykes	....	....	....	....	20,000.00	....
Cistern	....	....	....	....	....	....
Coal	....	....	....	....	....	....
Total	67,000.00	30,252.00	1,330.00	278,574.16	39,204.90	30,100.00

Object.	Norfolk.	Pensacola.	Mare Island.	Sacketts Harbor.	Key West.	Port Royal.	Total.
Yard buildings	$37,000.00	$7,997.17	$41,205,51	....	$1,247.50	$1,600.00	$277,899.74
Officers' quarters	10,000.00	6,501.28	10,515.42	....	450.00	800.00	43,088.70
Wharves, bridges, landings, and boats	7,000.00	18,123.10	1,950.00	....	....	700.00	47,103.10
Roads, walks, gutters, and drains	9,000.00	1,205.42	23,586.99	....	182.25	1,200.00	98,564.66
Fences and walls	1,000.00	1,562.66	5,393.00	....	843.00	400.00	13,443.66
Cranes, scows, and derricks	5,000.00	2,136.31	1,925.69	....	....	200.00	27,987.00
Furnaces, forges, heating apparatus, etc	1,000.00	261.02	6,636.35	....	....	850.00	25,209.17
Tracks and scales	1,500.00	765.68	901.70	....	....	150.00	11,806.38
Water, gas, and electric light works	20,000.00	1,680.85	9,710.98	....	....	300.00	25,461.83
Dredging and scowing	3,000.00	....	500.00	....	....	....	43,500.00
Dry docks	1,000.00	16,485.57	600.00	....	....	600.00	43,513.07
Miscellaneous repairs	7,000.00	1,718.31	8,000.00	$300.00	1,273.00	1,400.00	34,741.31
Dikes	....	....	....	....	....	....	20,000.00
Cistern	....	....	....	....	....	....	....
Coal	....	....	....	40.00	....	....	40.00
Total	84,500.00	58,438.17	110,925.64	340.00	3,995.75	7,700.00	712,358.62

No. 7.—*Detailed estimate for "general maintenance" received from yards and stations for the fiscal year ending June 30, 1895.*

Objects.	Portsmouth.	Boston.	New London.	New York.	League Island.	Washington.
Freight and transportation	$500.00	....	....	$500.00	....	$25.00
Printing, stationery, and advertising	500.00	$300.00	$150.00	2,000.00	$350.00	300.00
Books, maps, models, and drawings	100.00	1,000.00	....	1,500.00	200.00	25.00
Purchase and repair of fire engines	500.00	....	....	2,000.00	4,500.00	25.00
Machinery of every description and patent rights	500.00	....	....	10,000.00	2,000.00	50.00
Repairs on steam engines and attendance on same	1.500.00	....	....	8,000.00	1,500.00	25.00
Purchase and maintenance of oxen and horses, pay of hired teams, etc	5,000.00	5,000.00	1.050.00	18,000.00	4,500.00	5,000.00
Carts, timber wheels, and tools of every description	5,000.00	1,500.00	300.00	8,000.00	2,500.00	2,500.00
Postage on letters on public service, and telegrams, and telephone	25.00	50.00	200.00	300.00	100.00	25.00
Furniture for Government houses and offices in navy-yards	1,500.00	1,000.00	50.00	5,000.00	8,000.00	2,500.00
Coal and other fuel for yards and docks purposes	3,000.00	4,000.00	150.00	8,000.00	2,000.00	2,370.00
Candles, oil, and gas	1,000.00	500.00	20.00	300.00	250.00	1,050.00
Cleaning and clearing up yards and care of buildings	2,000.00	5,000.00	1,200.00	8,000.00	4,200.00	5,500.00
Attendance on fires, lights, fire engines, and apparatus	3,500.00	2,000.00	....	5,000.00	4,200.00	50.00
Incidental labor, not chargeable to other appropriations	1,000.00	500.00	1,200.00	3,500.00	1,000.00	1,500.00
Water tax and ice	....	3,000.00	....	8,000.00	....	....
Tolls and ferriage	25.00	....	25.00	200.00	....	....
Pay of watchmen	4,000.00	5,000.00	2,190.00	7,117.50	1.460.00	....
Flags, awnings, and packing boxes	50.00	100.00	....	400.00	1,000.00	300.00
Rent of landings	....	....	100.00	....	....	....
Rent of officers' quarters, Philadelphia, Pa	....	....	....	....	2,800.00	....
Total	29,700.00	28,950.00	6,635.00	95,817.50	40,560.00	21.245.00

Objects.	Norfolk.	Pensacola.	Mare Island.	Key West.	Port Royal.	Puget Sound.	Total.
Freight and transportation	$100.00	$75.00	$3,444.48	$200.00	$100.00	$200.00	$5,144.48
Printing, stationery, and advertising	500.00	275.00	500.00	20.00	250.00	300.00	5,445.00
Books, maps, models, and drawings	1,000.00	20.00	1,972.00	....	150.00	....	5,967.00
Purchase and repair of fire engines	500.00	664.50	1,973.44	....	300.00	....	10,462.94
Machinery of every description and patent rights	12,000.00	123.00	7,030.00	....	600.00	....	32,303.00
Repairs on steam engines and attendance on same	8,000.00	314.20	3,831.68	....	....	....	23,170.88
Purchase and maintenance of oxen and horses, pay of hired teams, etc	15,450.00	1,561.48	13,742.82	....	800.00	....	70,107.30
Carts, timber wheels, and tools of every description	8,000.00	566.80	3,434.50	....	400.00	....	32,201.30
Postage on letters on public service, and telegrams, and telephone	25.00	....	2,495.36	12.00	100.00	100.00	3,432.36
Furniture for Government houses and offices in navy-yards	5,000.00	472.60	3,000.00	....	6,500.00	10,000.00	43,022.60
Coal and other fuel for yards and docks purposes	3,500.00	228.90	14,400.00	....	1,200.00	800.00	39,648.90
Candles, oil, and gas	5,000.00	225.00	4,605.12	122.50	600.00	....	13,672.62
Cleaning and clearing up yards and care of buildings	5,700.00	1,659.48	12,469.60	200.00	1,800.00	....	47,789.08
Attendance on fires, lights, fire engines, and apparatus	3,676.00	2,478.76	4,442.88	....	850.00	....	26,197.64
Incidental labor, not chargeable to other appropriations	5,000.00	....	1,000.00	....	1,200.00	3,500.00	19,400.00
Water tax and ice	2,500.00	196.00	7,500.00	146.00	600.00	....	21,942.00
Tolls and ferriage	150.00	60.00	2,900.00	....	....	....	3,360.00
Pay of watchmen	11,504.00	7,504.40	2,204.60	1,995.00	2,200.00	....	45.175.50
Flags, awnings, and packing boxes	300.00	105.40	300.00	10.00	100.00	....	2.665.40
Rent of landings	....	....	....	....	....	....	100.00
Rent of officers' quarters, Philadelphia, Pa	....	....	....	....	....	....	2,800.00
Total	87,905.00	16,533.52	91,240.48	2,705.50	17,750.00	14,900.00	454,008.00

No. 8.—*Report showing amount expended during the fiscal year ending June 30, 1893, from appropriations pertaining to the Bureau of Yards and Docks for civilians employed on clerical duty or in any other capacity than ordinary mechanics and workingmen at the several navy-yards and stations, and submitting estimates for such civilian employés for the fiscal year 1895, in compliance with the third section of naval appropriation act approved January 30, 1885, Vol. 23, United States Statutes at Large, p. 295 (for a year of 365 days).*

Navy-yards and rating, and rate of pay.	Amount paid to civilians employed during the fiscal year ending June 30, 1893.	Estimates for civilian employés for the fiscal year ending June 30, 1895.	
		Rate of pay.	Amount.
PORTSMOUTH, N. H.			
Clerk, at $1,400 per annum	$1,400.00	$1,400.00	$1,400.00
Mail messenger, at $2 per diem*	702.00	2.00	730.00
Messenger, at $600 per annum	600.00	600.00	600.00
Foreman laborer and head teamster, at $4 per diem*	1,452.00	4.00	1,460.00
Pilot, at $3 per diem*	1,095.00	3.00	1,095.00
Janitor, at $600 per annum	600.00	600.00	600.00
Foreman mason, when required, at $4.50 per diem	1,289.25	4.50	1,408.50
One quarterman laborer, at $2.48 per diem	620.00	....	....
Total	7,758.25	....	7,293,50
BOSTON, MASS.			
Clerk, at $1,400 per annum	1,392.32	1,400.00	1,400.00
Foreman laborer, at $4 per diem	1,252.00	4.00	1,252.00
Messenger, to commandant, at $1.76 per diem	550.88	1.76	550.88
Messenger, at $1.76 per diem	550.88	1.76	550.88
Mail messenger, at $2 per diem*	730.00	2.00	730.00
Writer, at $900 per annum	900.00	900.00	900.00
Draftsman, at $4.56 per diem	1,363.44	....	....
Total	6,739.52	....	5,383.76
BROOKLYN, N. Y.			
Clerk, at $1,400 per annum	1,380.81	1,400.00	1,400.00
Writer, at $1,017.25 per annum	1,017.25	1,017.25	1,017.25
Two masters of tugs, at $1,500 each per annum	2,979.43	1,500.00	3,000.00
Two writers, at $900 each per annum	1,745.75	900,00	1,800.00
Foreman laborers, at $4.50 per diem	1,377.00	4.50	1,408.50
Mail messenger, at $2.25 per diem (increase submitted)*	712.00	2.25	821.25
Two messengers, at $2.25 each per diem	1,355.62	2.25	1,408.50
Draftsman, at $5 per diem	1,560.00	5.00	1,565.00
Quarterman, at $3 per diem	936.00	3.00	939.00
Superintendent of teams or quarterman, at $4 per diem	1,080.00	4.00	1,252.00
Messenger to commandant, at $2.25 per diem*	787.50	2.25	821.25
Two engineers for cranes, at $1,000 each per annum (submitted)	....	1,000.00	2,000.00
Electrician, at $1,200 per annum	910.67	1,200.00	1,200.00
Leveler on works of improvement, at $4 per diem	1,252.00	....	....
Quarterman wharf-builder on works of improvement, at $4 per diem	1,252.00	....	....
Quarterman joiner on works of improvement, at $4 per diem	1,236.00	....	....
Rodman, at $3 per diem	937.00	....	....
Superintendent of dump	1,650.00	....	....
Total	22,169.03	....	18,632.75
SACKETTS HARBOR, N. Y.			
Shipkeeper, at $1 per diem*	365.00	1.00	365.00
LEAGUE ISLAND, PA.			
Clerk, at $1,400 per annum	1,400.00	1,400.00	1,400.00
Writer and telegraph operator, at $1,000 per annum	1.000.00	1,000.00	1,000.00
Messenger, at $2 per diem	626.00	2.00	626.00
Foreman laborer, at $4 per diem	1,132.00	4.00	1,252.00
Draftsman, at $5 per diem	332.50	....	....
Assistant draftsman, at $3.50 per diem	232.75	....	....
Leveler, at $3.84 per diem	1,175.04	....	....
Subinspector, at $3.50 per diem	1,078.43	....	....
Rodman at $2.56 per diem	744.96	....	....
Quarter man joiner, at $3.54 per diem	824.82	....	....
Quarterman laborer, at $2.34 and $2.50 per diem	1,133.39	....	....
Total	9,679.89	....	4,278.00

* Sundays included.

No. 8.—*Report showing amount expended during fiscal year ended June 30, 1893, etc.*—Cont'd.

Navy-yards and rating, and rate of pay.	Amount paid to civilians employed during the fiscal year ending June 30, 1893.	Estimates for civilian employés for the fiscal year ending June 30, 1895.	
		Rate of pay.	Amount.
WASHINGTON, D. C.			
Clerk, at $1,400 per annum	1,400.00	1,400.00	1,400.00
Messenger, at $2 per diem	617.75	2.00	626.00
Foreman laborer, at $4 per diem	1,252.00	4.00	1,252.00
Electrician, at $1,000 per annum	1,000.00	1,000.00	1,000.00
Trackmaster, at $3.04 per diem	936.70		
Inspector of dredging, at $3 per diem	304.11		
Rodman, at $3 per diem	54.00		
Total	5,564.56		4,278.00
NORFOLK, VA.			
Clerk, at $1,400 per annum	1,399.92	1,400.00	1.400.00
Writer, at $1,017.25 per annum	1,017.15	1,017.25	1,017.25
Writer, at $1.000 per annum	1,000.00	1,000.00	1,000.00
Foreman laborer, at $4 per diem	1,252.00	4.00	1,252,00
Mail messenger, at $2 per diem*	730.00	2.00	730.00
Two messengers, at $2 each per diem	1,252.00	2.00	1,252.00
Pilot, at $2.26 per diem	707.38	2.26	707.38
Electrician, at $1,200 per annum	841.69	1,200.00	1,200.00
Draftsman, at $5 per diem (submitted)		5.00	1,565.00
Engineer for cranes, at $1,000 per annum (submitted)		1,000.00	1,000.00
Assistant draftsman, at $3.52 per diem	1,098.24		
Leveler, at $4 per diem	1,236.00		
Quarterman, at $3.52 per diem	1,021.24		
Diver, at $10 per diem	35.00		
Total	11,590.62		11,123.63
PENSACOLA, FLA.			
Clerk, at $1,200 per annum	1,200.00	1,200.00	1,200.00
Mail messenger, at $2 per diem*	730.00	2.00	730.00
Total	1,930.00		1,930.00
MARE ISLAND, CAL.			
Clerk, at $1,400 per annum	1,400.00	1,400.00	1,400.00
Writer, at $1,017.25 per annum	1,017.25	1,017.25	1,017.25
Foreman mason, at $6 per diem	1,848.00	6.00	1,878.00
Foreman laborer, at $5.50 per diem	1,721.50	5.50	1,721.50
Pilot, at $4.80 per diem	1,502.40	4.80	1,502.40
Draftsman, at $5 per diem	1,565.00	5.00	1,565.00
Mail messenger, at $2 per diem*	730.00	2.00	730.00
Messenger, at $2 per diem	626.00	2.00	626.00
Messenger and lamplighter, at $2 per diem	626.00	2.00	626.00
Electrician, at $1,200 per annum	1,200.00	1,200.00	1,200.00
Machinist in charge, at $4.50 per diem	1,361.78		
Quarterman joiner, at $4.48 per diem	1,360.80		
Rodman, at $2.00 per diem	605.50		
Telegraph operator, at $3.28 per diem	1,026.64		
Total	16,590.87		12,266.15
KEY WEST, FLA.			
Messenger, at $600 per annum	600.00	600.00	600.00
PORT ROYAL, S. C.			
Draftsman, at $5 per diem	1,415.00		
Rodman, at $2.40 per diem	149.40		
Two inspectors, at $4 and $2 per diem	496.20		
Total	2,060.60		
PUGET SOUND, PORT ORCHARD, WASH.			
Rodman, at $3 per diem	853.00		
Assistant draftsman, at $5 per diem	1,240.00		
Subinspector, at $3.50 per diem	472.50		
Five subinspectors, at $3.50 per diem	189.00		
Writer, at $3.25 per diem	227.50		
Total	2,982.00		

* Sundays included.

Recapitulation of expenditures for certain employés for the fiscal year ending June 30, 1893, and estimates for the fiscal year ending June 30, 1895, per act approved January 30, 1885. (Vol. 23, U. S. Stat. L., p. 295.)

Navy-yards and stations.	Expenditures 1892-'93.	Estimates 1894-'95.
Portsmouth, N. H	$7,758.25	$7,293.50
Boston, Mass	6,739.52	5,383.76
Sacketts Harbor, N. Y	365.00	365.00
Brooklyn, N. Y	22,169.03	18,632.75
League Island, Pa	9,679.89	4,278.00
Washington, D. C	5,564.56	4,278.00
Norfolk, Va	11,590.62	11,123.63
Pensacola, Fla	1,930.00	1,930.00
Key West, Fla	600.00	600.00
Mare Island, Cal	16,590.87	12,266.15
Port Royal, S. C	2,060.60	....
Puget Sound, Wash	2,982.00	....
Total	88,030.34	66,150.79

No. 9.—*Statement of the appropriations for the Bureau of Yards and Docks for the fiscal year ending June 30, 1893, and prior years, showing the amounts expended under each specific head of appropriation and the balances remaining unexpended June 30, 1893, as required by section 429, Revised Statutes.*

Appropriation for general maintenance, 1893	$230,000.00
Expended from July 1, 1892, to June 30, 1893	210,930.48
Balance on hand July 1, 1893	19,069.52
Which will be entirely absorbed.	
Appropriation for repairs and preservation, 1893	275,000.00
Expended from July 1, 1892, to June 30, 1893	238,488.41
Balance on July 1, 1893	36,511.59
Which will be entirely absorbed.	
Appropriation, civil establishment, 1893	61,380.69
Expended from July 1, 1892, to June 30, 1893	60,602.70
Balance on hand July 1, 1893	777.99
Which will revert to the Treasury.	
Appropriation for contingent, 1893	15,000.00
Expended from July 1, 1892, to June 30, 1893	14,085.19
Balance on hand July 1, 1893	914.81
Which will revert to the Treasury.	
Appropriation for Naval Home, 1893	70,215.00
Expended from July 1, 1892, to June 30, 1893	53,326.95
Balance on hand July 1, 1893	16,888.05
After liabilities are paid balance will revert to Treasury.	
Appropriation, navy-yard, Portsmouth, N. H.:	
For increasing water supply	6,350.00
For completing hydrant system	6,080.00
For reconstructings buildings Nos. 45 and 46	50,000.00
For constructing reservoir and perfecting water system	22,287.00
	84,717.00
Expended from July 1, 1890, to June 30, 1893	84,717.00
Appropriation, navy-yard, Portsmouth, N. H.:	
For coal pocket	$6,500.00
For construction of boiler house for buildings Nos. 45 and 46	7,000.00
	13,500.00
Expended from July 1, 1892, to June 30, 1893	6,043.16
Balance on hand July 1, 1893	7,456.84
Which will be entirely expended.	

Appropriation, navy-yard, Boston, Mass.:	
For new boiler and pumping machine, etc	$50,000.00
For constructing steel shears	12,000.00
For extensions and renewals in water-pipe system and repairs of wharves	5,000.00
	67,000.00
Expended from July 1, 1890, to June 30, 1893	64,276.51
Balance on hand July 1, 1890, to June 30, 1893	2,723.49
Which will be entirely absorbed.	
Appropriation, navy-yard, Brooklyn, N. Y.:	
For extending railroad system and necessary rolling stock	5,000.00
For completing approaches to timber dry dock	25,000.00
For repairing cob dock, improvement of Whitney Basin, rebuilding sea wall, and dredging	125,000.00
For relaying water pipes in the yard	15,000.00
For paving and sewers around new dry dock	21,835.00
For one crane	5,000.00
	196,835.00
Expended from July 1, 1890, to June 30, 1893	196,835.00
Appropriation, navy-yard, Brooklyn:	
For quay wall on cob dock	100,000.00
Expended from July 1, 1890, to June 30, 1893	99,074.00
Balance on hand July 1, 1893	926.00
Which will be entirely expended.	
Appropriation, navy-yard, Brooklyn, N. Y.:	
For quay-wall extension of cob dock	30,000.00
For gate at Sands street	5,000.00
	35,000.00
Expended from July 1, 1892, to June 30, 1893	28,537.19
Balance on hand July 1, 1893	6,462.81
Which will be entirely absorbed.	
Appropriation, navy-yard, League Island, Pa.:	
For rebuilding Broad street wharf	86,416.40
For building and furnishing officers' quarters	10,000.00
For construction of light retaining wall	25,000.00
	121,416.40
Expended from July 1, 1890, to June 30, 1893	121,416.40
Appropriation navy yard, League Island, Pa.:	
For dredging and filling in	75,000.00
For dredging and filling in and paving and improvement of grounds.	25,000.00
For extending permanent sea wall	25,000.00
For west dry-dock pier	87,441.62
For riprap for protection wall	9,150.00
For construction of light retaining wall	25,000.00
For sewers and flushing tank	5,685.00
	252,276.62
Expended from July 1, 1890, to June 30, 1893	212,578.60
Balance on hand July 1, 1893	39,698.02
Which will be entirely absorbed.	
Appropriation, navy-yard, League Island, Pa.:	
For extension of protection wall	20,000.00
For extension of light retaining wall	15,000.00
For ripraps for Broad street wharf	6,500.00
For branch sewer	2,100.00
	43,600.00
Expended from July 1, 1892, to June 30, 1893	21,246.47
Balance on hand July 1, 1893	22,353.53
Which will all be expended.	

Appropriation, navy-yard, Washington, D. C.:	
For changing building No. 7 into an apartment house of three stories	$10,000.00
For dredging and filling in	5,000.00
For extension of railroad tracks	3,567.50
For sanitary improvements for Smith quadrangle	5,000.00
For converting paint shop into two officers' quarters	8,220.59
	31,788.09
Expended from July 1, 1892, to June 30, 1893	31,788.09
Appropriation, navy-yard, Washington, D. C.:	
For dredging and filling in	5,000.00
For breech mechanism shop	15,000.00
	20,000.00
Expended from July 1, 1892, to June 30, 1893	16,499.72
Balance on hand July 1, 1893	3,500.28
Which will be entirely absorbed.	
Appropriation, navy-yard, Norfolk, Va.:	
Iron and steel shop	75,000.00
Boiler shop extension	14,448.00
Water system	20,000.00
Extension of quay wall	25,000.00
For completing approaches to timber dry dock	10,000.00
For connecting new pumps with old dry dock	15,000.00
For extending machine shop for steam engineering	9,166.00
	168,614.00
Expended from July 1, 1890, to June 30, 1893	168,614.00
Appropriation, navy-yard, Norfolk, Va.:	
For floating gate for granite dock	25,000.00
For coal shed	6,500.00
	31,500.00
Expended from July 1, 1892, to June 30, 1893	2,988.87
Balance on hand July 1, 1893	28,511.13
Appropriation, navy-yard, Norfolk, Va.:	
For railroad extension and system	15,000.00
Expended from July 1, 1890, to June 30, 1893	14,986.06
Balance on hand July 1, 1893	13.94
Which will be expended.	
Appropriation, construction of dock, Port Royal, S. C.:	
Toward the construction of a timber dry dock	350,000.00
For the capstan of dry dock, etc	150,000.00
	500,000.00
Expended from July 1, 1890, to June 30, 1893	315,576.43
Balance on hand July 1, 1893	184,423.57
Which will be expended.	
Appropriation for officers' quarters, Port Royal, S. C	5,000.00
For telephone line	1,500.00
	6,500.00
Expended from July 1, 1892, to June 30, 1893	54.12
Balance on hand July 1, 1893	6,445.88
Which will be expended.	
Appropriation, navy-yard, Mare Island, Cal.:	
For finishing boiler and machine shop	4,200.00
For extending coal wharf	30,000.00
For mud scow	4,500.00
	38,700.00
Expended from July 1, 1888, to June 30, 1893	38,700.00

Appropriation, navy-yard, Mare Island, Cal.:	
For bridge across sectional basin	$2,000.00
For building wagon road towards cemetery and magazine	5,000.00
For replanking wharves	5,000.00
For completing electric light plant	30,000.00
For completing repairs to sectional dry dock	15,000.00
For roads	5,000.00
For one 12-ton crane	4,000.00
For replanking wharves	3,000.00
	69,000.00
Expended from July 1, 1890, to June 30, 1893	69,000.00
Appropriations, navy-yard, Mare Island, Cal.:	
For boat landings	3,000.00
For widening gauge of railroad track	6,500.00
For extension of quay wall	25,000.00
For removal and reconstruction of return wall, sectional dry dock basin	11,285.24
For oil house for general storekeeper	8,000.00
For one 12-ton pillar wharf crane	3,800.00
For one locomotive for yard use	4,000.00
For straightning sea wall	20,000.00
	81,585.24
Expended from July 1, 1890, to June 30, 1893	60,753.86
Balance on hand July 1, 1893	20,831.38
Which will be entirely expended.	
Appropriation increase of the Navy:	
For one traveling crane of 40-tons capacity for dry dock at Mare Island	60,000.00
Expended from July 1, 1892, to June 30, 1893	87.20
Balance on hand July 1, 1893	59,912.80
Which will be all expended.	
Appropriation, adjustable steam dock for naval station, Key West, Fla.	30,000.00
Expended from July 1, 1889, to June 30, 1893	27,000.00
Balance on hand July 1, 1892	3,000.00
Which is held to pay reservation under the contract.	
Appropriation, electric lighting of navy-yards	60,000.00
Expended from July 1, 1889, to June 30, 1893	59,828.41
Balance on hand July 1, 1893	171.59
Which will be entirely expended.	
Appropriation, increase of the Navy, traveling cranes:	
For two traveling cranes, of 40-tons capacity, dry docks at Norfolk and New York	100,000.00
Expended from March 2, 1891, to June 30, 1893	99,383.50
	616.50
Which will be entirely expended.	
Appropriation, dry dock, Puget Sound, Wash.:	
For purchase of tract of land for dry-dock site and construction of dry dock upon said land	210,000.00
Expended from July 1, 1891, to June 30, 1893	47,144.40
Balance on hand July 1, 1893	162,855.60
Which will be entirely expended.	
Appropriation, navy-yard, Brooklyn, N. Y.:	
Extensions and improvements	593,860.33
Expended from July 1, 1892, to June 30, 1893	93,661.44
Balance on hand July 1, 1893	500,198.89
Which will be entirely expended.	

No. 10.—*Abstract and statement of offers received for contracts for improvements, materials, and services coming under the cognizance of the Bureau of Yards and Docks, as required by section 429, Revised Statutes, for fiscal year ending June 30, 1893.*

Offers for dry dock at Puget Sound naval station, under advertisement dated April 4, 1892:

San Francisco Bridge Company	$510,000.00
San Francisco Bridge Company	525,000.00
J. E. Simpson & Co	639,000.00
Foster & Huson	526,605.00
J. P. M. Phillips	480,500.00
J. P. M. Phillips	500,500.00
J. P. M. Phillips	504,636.00
J. P. M. Phillips	524,636.00
Nelson Bennett	568,348.00
Nelson Bennett	588,348.00
Daniel McPhee	446,207.00
Henry & Balch	590,000.00
Mathew Branagan	418,000.00
F. T. Cantara and W. A. Shahan	546,273.00
F. T. Cantara and W. A. Shahan	530,211.00
F. T. Cantara and W. A. Shahan	529,749.00
Neidergerass, Hill & Co	619,000.00
California Bridge Company	679,448.00
Rigby & Evans	669,000.00

No award; readvertised.

Offers for timber dry dock at the United States navy-yard, Brooklyn, N. Y., under advertisement dated May 12, 1892:

B. G. Bailey	$477,000.00
Justin McCarthy	577,900.00
John H. O'Rouke and M. J. Dady	663,000.00
J. E. Simpson & Co	537,579.00
P. Sanford Ross	674,000.00
James D. Leary	620,000.00
P. J. Miniter	595,000.00
R. G. Packard	586,000.00
John Gillies *	412,000.00

Offers for dredging at navy-yard, Brooklyn, N. Y., under advertisement dated August 4, 1892:

Atlantic Dredging Company	per cubic yard..	.29¼
W. H. Beard Dredging Company	do....	.27¼

No award; readvertised.

Offers for dredging at navy-yard, Brooklyn, N. Y., under advertisement dated September 2, 1892:

W. H. Beard Dredging Company *	per cubic yard..	.26¼
Atlantic Dredging Company	do....	.30

Offers for dry dock at Puget Sound naval station, Washington, under advertisement dated August 8, 1892:

Rigby & Evans	$513,000.00
Rigby & Evans	500,000.00
Byron Barlow & Co.*	491,465.00
Byron Barlow & Co	508,985.00
James Partee	591,000.00
James Partee	569,000.00
Foster & Huson	545,000.00
Bates & King	514,900.00
J. P. M. Phillips	475,190.00
Nelson Bennett	500,000.00
Charles H. Baker & Co	509,000.00
San Francisco Bridge Company	549,000.00
San Francisco Bridge Company	539,000.00

Offers for the construction of a protection wall at navy-yard, League Island, Pa., under advertisement dated September 10, 1892:

Frank C. Arthur *	$13,360.00
William A. Mundy	15,582.00

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* Accepted.

Offers for the construction of an iron and steel pier at the United States naval coaling station in the harbor of Pago Pago, Samoa, under advertisement dated October 22, 1892:

J. P. M. Phillips	$85,900.00
K. C. Eldridge, John Eightman & Co	123,450.00
Benjamin Hyde	120,000.00
B. McMahon & Son	71,700.00
San Francisco Bridge Company	88,900.00
Bath Iron Works	149,500.00
Robert A. Graham	142,752.00
J. H. Hathaway & Co	121,000.00
Coronado Foundry and Machine Company	84,697.00
B. McMahon & Son	78,700.00
Portland Bridge and Building Company	149,775.00

No award.

Offers for an iron truss framing at navy-yard, Boston, Mass., under advertisement dated December 10, 1892:

S. C. Forsaith Machine Company	$685.00
The Smead & Co. Iron Works	850.00
Manchester Supply Company*	667.00

Offers for constructing and delivering a 40-ton locomotive crane at the United States navy-yard, Mare Island, California, under advertisement dated November 26, 1892:

S. C. Forsaith Machine Company	$82,000.00
Wm. Sellers & Co., incorporated	57,480.00
American Ship Windlass Company	55,866.00

No award; readvertised.

Offers for double-pipe well to be driven at the navy-yard, Brooklyn, N. Y., under advertisement dated March 21, 1893:

Germantown Artesian Well Company	per foot	$7.00

No award.

Offers for constructing and delivering a 40-ton locomotive crane at the United States navy-yard, Mare Island, California, under advertisement dated April 6, 1893:

W. E. Drew*	$48,697.00
Wm. Sellers & Co., incorporated	51,950.00

Offers for officers' quarters at Port Royal, S. C., under advertisement dated May 8, 1893:

Colin McK. Grant	$18,900.00
Henry Oliver	20,476.00
The Barawell Manufacturing Company*	12,322.00
Chas. B. Allen	22,292.00

Offers for repairs to wharf No. 6, at the United States navy-yard, Boston, Mass., under advertisement dated June 7, 1893:

John Mannion	$9,454.00
Alex McInnis*	4,550.00
Trumbell & Ryan	5,675.00
Wm. L. Miller	7,433.00
J. N. Haynes & Co.	5,767.00
Benjamin Young	14,000.00

Offers for dredging at the United States navy-yard, Brooklyn, N. Y., under advertisement dated June 10, 1893:

Morris & Cummings Dredging Company	per cubic foot	.28
P. Sanford Ross	do	.27½
Atlantic Dredging Company	do	.27¾
W. H. Beard Dredging Company*	do	.26¼

Offers for construction of a protection wall at United States navy-yard, League Island, Pennsylvania, under advertisement dated June 7, 1893:

Wm. A. Mundy	per linear foot	$95.00
Jos. S. Allen*	do	87.69

Offers for officers' quarters at Port Royal, S. C., under advertisement dated July 28, 1892:

Peter Hepburn	$7,354.00
Colion McK. Grant	6,000.00
John H. McKenzie	11,000.00

No award; readvertised.

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* Accepted.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Yards and Docks, Navy Department.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
SALARIES.			
One chief clerk (act Mar. 3, 1893)	$1,800.00		
One draftsman and clerk (act Mar. 3, 1893)	1,800.00		
One clerk of class four (act Mar. 3, 1893)	1,800.00		
One clerk of class three (act Mar. 3, 1893)	1,600.00		
One clerk of class two (act Mar. 3, 1893)	1,400.09		
One clerk of class one (act Mar. 3, 1893)	1,200.00		
One assistant messenger (act Mar. 1893)	720.00		
One laborer (act Mar. 1893)	660.00		
		$10,980.00	$10,980.00
MAINTENANCE YARDS AND DOCKS, 1895.			
For general maintenance of yards and docks, namely: For freight, transportation of materials and stores; books, maps, models, and drawings; purchase and repair of fire engines; machinery; repairs on steam fire engines and attendance on the same; purchase and maintenance of oxen, horses, and driving teams; carts, timber wheels, and all vehicles for use in the navy-yards; tools and repairs of the same; postage on letters and other mailable matter on public service sent to foreign countries, and telegrams; stationery; furniture for Government houses and offices in the navy-yards; coal and other fuel, candles, oil, and gas; cleaning and clearing up yards and care of buildings; attendance on fires, lights, fire engines, and apparatus; for incidental labor at navy-yards; water tax, tolls, and ferriage; rent of four officers' quarters at Philadelphia, Pa.; pay of watchmen in navy-yards; awnings, and packing boxes, and advertising for yards and docks, and other purposes (act Mar. 3, 1893)	250,000.00	250,000.00	230,000.00
CONTINGENT YARDS AND DOCKS, 1895.			
For contingent expenses that may arise at navy-yards and stations (act Mar. 3, 1893)	15,000.00	15,000.00	15,000.00
REPAIRS AND PRESERVATION, 1895.			
For navy-yards and stations (act Mar. 3, 1893)	300,000.00	300,000.00	275,000.00
CIVIL ESTABLISHMENT, YARDS AND DOCKS, 1895.			
Navy-yard, Portsmouth, N. H.			
One clerk, at $1,400 per annum (act Mar. 3, 1893)	1,400.00		
One mail messenger, at $2 per diem * (act Mar. 3, 1893)	730.00		
One messenger, at $600 per annum (act Mar. 3, 1893)	600.00		
One foreman and head teamster, at $4 per diem* (act Mar. 3, 1893)	1,460.00		
One janitor, at $600 per annum (act Mar. 3, 1893)	600.00		
One pilot, at $3 per diem* (act Mar. 3, 1893)	1,095.00		
One foreman mason, when required, at $4.50 per diem (act Mar. 3, 1893)	1,408.50		
		7,293.50	7,298.00
Navy-yard, Boston, Mass.:			
One clerk, at $1,400 per annum (act Mar. 3, 1893)	1,400.00		
One foreman laborer, at $4 per diem (act Mar. 3, 1893)	1,252.00		
One messenger to commandant, at $1.76 per diem (act Mar. 3, 1893)	550.88		
One messenger, at $1.76 per diem (act Mar. 3, 1893)	550.88		
One mail messenger, at $2 per diem* (act Mar. 3, 1893)	730.00		
One writer, at $900 per annum (act Mar. 3, 1893)	900.00		
		5,383.76	5,383.76
Naval station, Sacketts Harbor, N. Y.:			
One ship-keeper, at $365 per annum (act Mar. 3, 1893)	365.00		
		305.00	365.00
Naval station, Key West, Fla.:			
One messenger, at $000 per annum (act Mar. 3, 1893)	600.00		
		600.00	600.00
Navy-yard, Brooklyn, N. Y.:			
One clerk, at $1,400 per annum (act Mar. 3, 1893)	1,400.00		
One writer, at $1,017.25 per annum (act Mar. 3, 1893)	1,017.25		
Two masters of tugs, at $1,500 each per annum (act Mar. 3, 1893	3,000.00		
Two writers, at $900 each, per annum (act Mar. 3, 1893)	1,800.00		

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
CIVIL ESTABLISHMENT YARDS AND DOCKS, 1895—cont'd.			
Navy-yard, Brooklyn, N. Y.—Continued.			
One foreman laborer, at $4.50 per diem (act Mar. 3, 1893)	$1,408.50		
One mail messenger, at $2 per diem* (act Mar. 3, 1893)	730.00		
Two messengers, at $2.25 per diem (act Mar. 3, 1893)	1,408.50		
One draftsman at $5 per diem (act Mar. 3, 1893)	1,565.00		
One quarterman, at $3 per diem (act Mar. 3, 1893)	939.00		
One superintendent of teams or quarterman, at $4 per diem (act Mar. 3, 1893)	1,252.00		
One messenger to commandant, at $2.25 per diem* (act Mar. 3, 1893)	821.25		
One electrician, at $1,200 per annum (act Mar. 3, 1893)	1,200.00		
		$16,541.50	$16,541.50
Navy-yard, League Island, Pennsylvania:			
One clerk, at $1,400 per annum (act Mar. 3, 1893)	1,400.00		
One writer and telegraph operator, at $1,000 per annum (act Mar. 3, 1893)	1,000.00		
One messenger, at $2 per diem (act Mar. 3, 1893)	626.00		
One foreman laborer, at $4 per diem, (act Mar. 3, 1893)	1,252.00		
		4,278.00	4,278.00
Navy-yard, Washington, D. C.:			
One clerk, at $1400 per annum (act Mar. 3, 1893)	1,400.00		
One messenger, at $2 per diem (act Mar. 3, 1893)	626.00		
One foreman laborer, at $4 per diem (act Mar. 3, 1893)	1,252.00		
One electrician, at $1,000 per annum (act Mar. 3, 1893)	1,000.00		
		4,278.00	4,278.00
Navy-yard, Norfolk, Va.:			
One clerk, at $1,400 per annum (act Mar. 3, 1893)	1,400.00		
One writer, at $1,017.25 per annum (act Mar. 3, 1893)	1,017.25		
One writer, at $1,000 per annum (act Mar. 3, 1893)	1,000.00		
One foreman laborer, at $4 per diem (act Mar. 3, 1893)	1,252.00		
One electrician, at $1,200 per annum (act Mar. 3, 1893)	1,200.00		
One mail messenger, at $2 per diem* (act Mar. 3, 1893)	730.00		
Two messengers, at $2 per diem each (act Mar. 3, 1893)	1,252.00		
One pilot, at $2.26 per diem (act Mar. 3, 1893)	707.38		
		8,558.63	8,558.63
Navy-yard, Pensacola, Fla.:			
One clerk, at $1,200 per annum (act Mar. 3, 1893)	1,200.00		
One mail messenger, at $2 per diem* (act Mar. 3, 1893)	730.00		
		1,930.00	1,930.00
Navy-Yard, Mare Island, Cal.:			
One clerk, at $1,400 per annum (act Mar. 3, 1893)	1,400.00		
One writer, at $1,017.25 per annum (act Mar. 3, 1893)	1,017.25		
One foreman, at $6 per diem (act Mar. 3, 1893)	1,878.00		
One foreman laborer, at $5.50 per diem (act Mar. 3, 1893)	1,721.50		
One pilot, at $4.80 per diem (act Mar. 3, 1893)	1,502.40		
One draftsman, at $5 per diem (act Mar. 3, 1893)	1,565.00		
One mail messenger, at $2 per diem* (act Mar. 3, 1893)	730.00		
One messenger, at $2 per diem (act Mar. 3, 1893)	626.00		
One messenger and lamplighter, at $2 per diem (act Mar. 3, 1893)	626.00		
One electrician, at $1,200 per annum (act Mar. 3, 1893)	1,200.00		
		12,266.15	12,266.15
NAVAL HOME, PHILADELPHIA, PA., 1895.			
One superintendent (act Mar. 3, 1893)	600.00		
One steward (act Mar. 3, 1893)	480.00		
One matron (act Mar. 3, 1893)	360.00		
One chief cook (act Mar. 3, 1893)	360.00		
One assistant cook (act Mar. 3, 1893)	240.00		
One assistant cook (act Mar. 3, 1893)	180.00		
One chief laundress (act Mar. 3, 1893)	192.00		
Four laundresses, at $168 each (act Mar. 3, 1893)	672.00		
Four scrubbers, at $168 each (act Mar. 3, 1893)	672.00		
Eight waiters, at $168 each (act Mar. 3, 1893)	1,344.00		
Eight laborers, at $240 each (act Mar. 3, 1893)	1,920.00		
One stable-keeper and driver (act Mar. 3, 1893)	360.00		
One master-at-arms (act Mar. 3, 1893)	480.00		
Two house corporals, at $300 each (act Mar. 3, 1893)	600.00		
One barber (act Mar. 3, 1893)	360.00		

*Including Sundays.

Estimates of appropriations for the service, etc.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
NAVAL HOME, PHILADELPHIA, PA., 1895—continued.			
One carpenter (act Mar. 3, 1893)	$845.00		
One painter (act Mar. 3, 1893)	600.00		
One engineer to run elevator (act Mar. 3, 1893)	600.00		
		$10,865.00	$10,865.00
Water rent and gas (act Mar. 3, 1893)	2,400.00		
Burial expenses and headstones (act Mar. 3, 1893)	350.00		
Improvement of grounds (act Mar. 3, 1893)	500.00		
Repairs to buildings, furnaces, grates, ranges, furniture, and repairs of furniture (act Mar. 3, 1893)	5,000.00		
Music in chapel (act Mar. 3, 1893)	600.00		
Transportation of indigent and destitute beneficiaries to the Naval Home (act Mar. 3, 1893)	500.00		
		9,350.00	9,350.00
Support of beneficiaries (act Mar. 3, 1893)	57,100.00	57,100.00	48,000.00
To reset and repair footway in front of wharf (act Mar. 3, 1893)			1,000.00
NAVY-YARDS AND STATIONS.			
Navy-yard, Portsmouth, N. H. (act Mar. 3, 1893)			15,000.00
Navy-yard, Boston, Mass.:			
For an electric-light plant. Submitted. (Act Mar. 3, 1893)	15,000.00	15,000.00	20,000.00
Navy-yard, Brooklyn, N. Y.:			
For caisson for granite dock. Submitted	35,000.00		
For renewing buildings Nos. 114, 115, and 116 (C. and R.). Submitted	70,000.00		
For grading, paving, and laying of sewers. Submitted.	10,000.00		
For quay wall inside of Whitney Basin. Submitted. (Act Mar. 3, 1893)	25,000.00		
		140,000.00	300,000.00
Navy-yard, League Island, Pa.:			
For protection wall. Submitted	25,000.00		
For completion of shear legs. Submitted	11,900.00		
For an electric-light plant. Submitted	10,000.00		
For completing east dry dock pier (partially appropriated for). Submitted. (Act Mar. 3, 1893)	40,000.00		
		86,900.00	78,000.00
Navy-yard, Washington, D. C.:			
For extension of yard wall through marsh. Submitted	24,693.00		
For retaining wall for and raising lower floor, store No. 10. Submitted	10,915.00		
For locomotive wrecking crane. Submitted	7,500.00		
For completing conversion of mold loft building into forge shop. Submitted. (Act Mar. 3, 1893)	6,936.00		
		50,044.00	30,500.00
Navy-yard, Norfolk, Va.:			
For extension of electric plant. Submitted	8,000.00		
For sewers, drains, and water closets in offices and shops. Submitted	5,000.00		
For continuing quay wall. Submitted. (Act Mar. 3, 1893)	0,000.00		
		43,000.00	23,000.00
Naval station, Port Royal, S. C.:			
For repairs to main wharf. Submitted. (Act Mar. 3, 1893)	18,368.00	18,368.00	12,096.00
Naval station, Algiers, La			25,000.00
Navy-yard, Mare Island, Cal.:			
For extending yard railroad. Submitted	18,332.00		
For navy-yard roads. Submitted	5,000.00		
For shed over galvanizing plant. Submitted	3,750.00		
For cottage for electrician. Submitted	1,937.00		
For navy-yard chapel. Submitted. (Act March 3, 1893).	8,000.00		
		37,019.00	41,648.00
Puget Sound naval station, Wash.:			
For artesian well. Submitted. (Act March 3, 1893)	3,500.00	3,500.00	225,000.00
Naval station, Key West, Fla.:			
For coaling shed. Submitted	10,000.00	10,000.00	
		403,831.00	770,244.00

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the U. S. Naval Observatory.

Detailed objects of expenditure, and explanations. (Public works under Navy Department.)	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
NEW NAVAL OBSERVATORY.		
Grounds and roads:		
For continuing grading, extending roads and paths, and improving grounds of new Naval Observatory, including filling ravines to Massachusetts avenue extended, to be immediately available (act Mar. 3, 1893, Vol. 27, p. 722, sec. 1)	$12.000	$12,000
Sleeping quarters:		
For fitting out rooms in Observatory for sleeping quarters for night observers. Submitted	1.200	....
Instruments and accessories:		
For miscellaneous instruments and accessories, viz, one comet-seeker, $400; one standard mercurial barometer, $400; one magnetic theodolite, $800; one dip circle, $250; one earth-inductor inclinometer, $300; one galvanometer, $80; one telescope and scale, $50; one quadrant galvanometer, $62; one compensator, $14; glass scales, $100; beam suspensions, $100; one photographic register, $150; one alt-azimuth instrument, mounted and protected from weather, $6,500; eyepieces and shades, $250; one 12-inch object glass, $2,000; to be immediately available. Submitted	11,456	....
New Naval Observatory:		
For freight elevator. Submitted	500	....
	25,156	16,500

REPORT

OF

THE CHIEF OF THE BUREAU OF EQUIPMENT.

NAVY DEPARTMENT, BUREAU OF EQUIPMENT,
Washington, October 2, 1893.

SIR: I have the honor to submit the report of this Bureau for the fiscal year ending June 30, 1893, and the estimates for the fiscal year ending June 30, 1895. The report includes the business operations of the Bureau and appended are the reports of the Superintendent of the Naval Observatory, of the Superintendent of the Nautical Almanac, of the Inspector of Electric Lighting, and of the Superintendent of Compasses.

The report of the officer in charge of the observatory at the Mare Island navy-yard is also forwarded as a matter of general interest.

The following were the appropriations for the Bureau and its branches:

Equipment of vessels	$925,000
Contingent	12,000
Civil establishment	19,025
Increase of the Navy	400,000
Naval Observatory	32,200
Nautical Almanac	10,200

By strict economy in expenditures the above amounts have been sufficient for requirements and no deficiency will appear.

At the Boston navy-yard, at which are the chief manufacturing establishments of the Bureau, the following was made at a cost of material of $33,743.02 and of labor $45,767.85:

In the ropewalk:		
Hemp rope	pounds.	270,810
Wire rope	do...	52,843
Bolt rope	do...	14,632
Marline, codline, hambroline, houseline, etc	do...	34,973
Total	do...	373,258
In the forge, anchor and chain shop, and rolling mill:		
Chain cables of various sizes	pounds..	271,425
Six anchors, total weight	do...	31,841
Fifty-one anchor lashings, 21 shank painters, 21 ring stoppers, 40 marline spikes, 1 mooring swivel, 1 spare anchor shackle, 14 balancing shackles and clamps, aggregating	pounds..	6,545
Total	do...	309,811

In addition to the above eight anchors were altered to the standard pattern.

There were rolled 313,855 pounds of iron of excellent quality. If scrap of proper chemical characteristics were obtainable these rolling mills could supply all the iron needed for the Bureau's purposes.

In the machine shop and foundry 23,546 pounds of chain studs and galley parts and linings were manufactured.

It is regarded as of the first necessity that all articles of the above classes should be of the highest quality, and in this respect the work done here is a standard.

There was expended abroad: Equipment, $358,592.28. Of this, $301,066.23 was expended for 33,797 tons of coal, making an average cost per ton of $8.85.

There were also purchased at home 33,257$\frac{727}{2240}$ tons of coal, costing $147,999.04, at an average price of $4.48 per ton.

The sum of $449,562.72 was expended for material and labor during the fiscal year in equipping ships at the several navy-yards.

Hemp for the manufacture of cables, towlines, and rope, to the amount of 165$\frac{3}{2240}$ tons, was purchased, at an expenditure of $28,766.48.

There was expended in the sail lofts of the various yards the sum of $60,245.45 for labor and $46,558.73 for material, and in the rigging lofts $20,697.48 for labor and $28,757.64 for material, making a total expenditure in these lofts of $156,259.30.

Of the total of 66,590 tons of coal used during the year, 47,645 tons, or 71 per cent, were used for steaming and 18,945 tons, or 29 per cent, for auxiliary purposes, under which latter head are included electric lighting, distilling, heating, flushing water-closets, cooking, ventilation, and steam cutter service.

The percentage of consumption for these purposes, so far as relates to the new ships, is shown herewith.

Ship.	Steaming.	Auxiliary.
	Per cent.	*Per cent.*
Atlanta	98	2
Bennington	99	1
Boston	29	71
Baltimore	66	34
Bancroft	33	67
Chicago	47	53
Concord	53	47
Charleston	72	28
Cushing	61	39
Dolphin	97	3
Miantonomoh	98	2
Monterey	33	67
Newark	98	2
Philadelphia	38	62
Petrel	50	50
San Francisco	69	31
Yorktown	90	10

There has been a steady advance in the extent and character of the electrical work on board ship. It is safe to say that the electrical equipment of the ships of the Navy affords a standard for marine work. It may here be noted that in the short period which has elapsed since vessels of the *Concord* class were fitted, dynamos of like power with those furnished these ships are now being supplied, having only three-fourths the weight and occupying not more than one-half the floor space.

The Bureau feels that the service is to be congratulated upon the work done by the officers employed in this specialty.

Very respectfully,

F. E. CHADWICK,
Chief of Bureau of Equipment.

The SECRETARY OF THE NAVY.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Equipment, Navy Department.

Detailed object of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
EQUIPMENT OF VESSELS.			
For purchase of coal for steamers and ships' use, including expenses of transportation, storage, and handling the same; hemp, wire, iron, and other materials for the manufacture of cordage, anchors, cables, galleys, and chains; canvas for the manufacture of sails, awnings, hammocks, and other work; water for steam launches; stationery for commanding and navigating officers of ships, equipment officers on shore and afloat, and for the use of courts-martial on board ship, and for the purchase of all other articles of equipment at home and abroad, and for the payment of labor in equipping vessels and manufacture of equipment articles in the several navy-yards; foreign and local pilotage and towage of ships of war; services and materials in repairing, correcting, adjusting, and testing compasses on shore and on board ship; nautical and astronomical instruments and repairs to same; libraries for ships of war; professional books and papers and drawings and engravings for signal books; naval signals and apparatus, namely, signals, lights, lanterns, rockets, running lights; compass fittings, including binnacles, tripods, and other appendages of ships' compasses, logs, and other appliances for measuring the ship's way, and leads and other appliances for sounding; lanterns and lamps and their appendages for general use on board ship for illuminating purposes, and oil and candles used in connection therewith; bunting and other materials for making and repairing flags of all kinds; photographic instruments and materials; musical instruments and music; and installing and maintaining electric light and interior signal communications on board vessels of war. (Appropriated Mar. 3, 1893, pamphlet edition, pp. 13, 14.)		$1,100,000.00	$925,000.00
NOTE.--This increased estimate over previous years is based upon the fact of a large increase in consumption of coal, as well as the general equipment expenditures by the addition to the Navy of a number of new cruisers now in course of construction, and which will be in commission during the fiscal year 1895. As shown by a careful estimate in the matter of coal alone, herewith submitted there will be an increased expenditure of about $191,000.			
CONTINGENT.			
For freight and transportation of equipment stores, packing boxes and materials, printing, advertising, telegraphing, books, and models; furniture for equipment offices in navy-yards; postage on letters sent abroad; ferriage, ice, lighterage of ashes, and emergencies arising under cognizance of the Bureau of Equipment unforeseen and impossible to classify. (Appropriated Mar. 3, 1893, pamphlet edition, p. 14.)		12,000.00	12,000.00
SALARIES.			
One chief clerk (appropriated Mar. 3, 1893, R. S., p. 70, sec. 416, pamphlet edition, p. 31)	$1,800.00		
One clerk of class 2 (same act)	1,400.00		
One clerk of class 1 (same act)	1,200.00		
Two copyists, at $900 each (same act)	1,800.00		
One assistant messenger (same act)	720.00		
One laborer (same act)	660.00	7,580.00	7,580.00
CIVIL ESTABLISHMENT			
Navy-yard, Portsmouth, N. H.:			
One clerk (appropriated Mar. 3, 1893, pamphlet edition, p. 14)	1,200.00		
One clerk (same act)	1,600.00		
Navy-yard, Boston, Mass.:			
One superintendent of ropewalk (same act)	1,875.00		
One clerk (same act)	1,400.00		
Do	1,300.00		
One writer (same act)	950.00		

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Equipment, Navy Department—Continued.

Detailed object of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1891.
CIVIL ESTABLISHMENT—continued.			
Navy yard, New York:			
One clerk (same act)	$1,400.00		
Do	1,250.00		
One writer (same act)	1,000.00		
One storekeeper (same act)	900.00		
Navy-yard, League Island, Pennsylvania:			
One clerk (same act)	1,200.00		
Navy-yard, Norfolk, Va.:			
Two clerks, at $1,200 each (same act)	2,400.00		
Navy-yard, Washington, D. C.:			
One clerk (same act)	1,000.00		
Navy-yard, Mare Island, California:			
One clerk (same act)	1,200.00		
Do	1,000.00		
		$19,025.00	$19,025.00

Schedule of bids for material at the New Naval Observatory, opened July 30, 1892.

Class 2:	
Tissot & Schultz*	$88.70
Class 6:	
F. A. Schneider*	.15
Class 11:	
No bid.	
Class 14*a*:	
Tissot & Schultz	50.00
Manhattan Supply Company	62.40
F. A. Schneider*	13.50
Class 14*b*:	
Manhattan Supply Company	43.90
F. A. Schneider*	26.07
Class 19:	
No bid.	
Class 20:	
Manhattan Supply Company	9.80
F. A. Schneider*	5.80
Class 23:	
Tissot & Schultz	62.00
Manhattan Supply Company*	40.90
F. A. Schneider	80.00
Class 24:	
F. A. Schneider*	117.80
Class 26:	
S. S. Daish & Son	207.06
W. M. Galt & Co	216.75
Class 31:	
Manhattan Supply Company	12.60
F. A. Schneider*	7.60
S. C. Forsaith Machine Company	21.96

Schedule of bids for fuel, etc., at the New Naval Observatory, opened August 20, 1892.

Class 11:	
Johnson Brothers	$3,450
Mayfield & Hieston*	3,100
Frank A. Kennedy	3,375
Charles Werner	3,325
Class 19:	
No bid.	

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* Awarded.

REPORT OF THE SUPERINTENDENT NAVAL OBSERVATORY.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, September 28, 1893.

SIR: In compliance with the Bureau's No. 2198, dated June 17, 1893, I have the honor to submit the annual report of the United States Naval Observatory for the fiscal year ending June 30, 1893, accompanied by a duplicate set of annual estimates. (Appendix A.)

The naval officers on duty at the Observatory at the beginning of the fiscal year, July 1, 1892, were: Capt. F. V. McNair, superintendent; Commander Joshua Bishop; Lieut. Commander Walton Goodwin; Profs. William Harkness, J. R. Eastman, Edgar Frisby, S. J. Brown, and Passed Assistant Engineer A. V. Zane. Changes—reported for duty: 1892, Lieut. William H. Beehler on July 28; Lieut. L. C. Heilner on August 26; 1893, Lieut. A. G, Winterhalter (temporarily) on January 16; Lieut. C. C. Marsh April 8; Ensign A. N. Mayer March 1. Detached: 1892, Lieut. Commander Walton Goodwin on August 5; Lieut. William H. Beehler, December 14. Lieut. A. G. Winterhalter, on March 27, 1893, was assigned to special duty in charge of Naval Observatory exhibit at the World's Fair, Chicago, Ill.

On May 15, 1893, the old Naval Observatory, Twenty-third and E streets, Washington, D. C., was formally abandoned as an observatory and the new site on Georgetown Heights, Washington, D. C., officially occupied.

On October 2, 1888, a contract was awarded by the Navy Department for the erection of the buildings for a new Naval Observatory, with necessary offices for observers, stipulating that the work should be performed by April 2, 1890. This contract was extended from time to time until forfeited on September 8, 1891. After the preliminaries of inventory, valuation, and advertisement, a new contract for the completion of this work was entered into on February 16, 1892, which provided that the buildings should be finished by June 1, 1892. This time was, however, extended until February 11, 1893, when the buildings were accepted by the Government.

During the progress of the construction of these buildings contracts were made and the work performed under appropriations for the following, namely: For inclosing grounds; for bookcases, railing, shelving, standards, etc.; for transporting instruments, apparatus, piers, books, and other articles from the old to the new observatory; for repairing and remounting the great equatorial (26-inch) and its accessories, including observers' elevating platform; for repairing and remounting the meridian circle and its accessories; for repairing and remounting the transit instrument and its accessories; for repairing and remounting the prime vertical transit instrument; for furniture and gas or electric fixtures for main building, great equatorial building, clock buildings, transit houses, boiler house, and magnetic buildings; for the construction of well tank, cistern, and for purchasing and placing pump, boiler, ejectors, and pipes for water supply; for installation of electric plant; for standard clock; for clock-room fittings, including clocks, reflectors, piers, instruments, and all accessories, complete; for official residence of the Superintendent, and for grading, macadamizing, and guttering roads around the observatory buildings. A contract has also been awarded for a new meridian circle (6-inch objective).

Observatory lane, the entrance to the observatory grounds from the Tennallytown road, has been graded, macadamized, lighted, and a new entrance gate erected. Roads have been graded and macadamized through a large portion of the grounds, and the valley contiguous to the boiler house practically filled in; the grounds have been inclosed as authorized, and the paths partially completed. When Massachusetts avenue shall have been graded, the principal entrance to the Naval Observatory will be on that thoroughfare.

Few observations of the heavenly bodies have been made since my last annual report, as all the principal instruments were undergoing repairs. The naval officers, assistant astronomers, and computers have been engaged in supervising and inspecting instruments and their accessories while being dismounted, repaired, transferred, remounted, and adjusted; in establishing the position of the new Naval Observatory (latitude 38° 55′ 14.68″ north, longitude 5^{h} 08^{m} 15.71^{s} west of Greenwich), and in the reduction and preparation of the observations on hand.

Chronometers have been carefully tested for changes of temperature and rated, and together with sextants, octants, glasses, clocks, and other nautical instruments have been supplied to vessels of the Navy, as directed.

The time of noon, seventy-fifth meridian west of Greenwich, has been sent over the telegraph wires daily, without the omission of a single day, Sundays excepted, and facilities have been extended for determining the longitudes of localities throughout the United States, when requested. Inquiries having been frequently made relative to obtaining standard time from this Government Observatory, I quote the following from a memorandum to the Bureau of Equipment, dated March 12, 1892:

> (1) As a Government institution the observatory diffuses the results of its observations, either directly or indirectly, as widely as practicable, among the taxpayers who support it, and therefore have the right to participate in the benefits arising from its work.
>
> (2) The results of observations for clock corrections have been regularly given by means of telegraphic time-signals for more than a quarter of a century, without distinction or cost, to all individuals or corporations who may apply and provide the necessary apparatus for putting the signals upon their own lines.
>
> (3) When the signals are once upon the wires it is manifestly impossible for the observatory to control either the range of their distribution or the accuracy with which they are transmitted from one circuit to another. For that reason the observatory limits its responsibility to the furnishing of an accurate daily signal at noon of the seventy-fifth meridian time. It has nothing whatever to do with the distribution of these signals and is alike indifferent to the extension or contraction of the time-service. It is for the public to decide whose time-signals they prefer and how they will obtain them.
>
> (4) The Naval Observatory has special directions concerning the Government offices in the District of Columbia.

Prof. William Harkness, U. S. Navy, chief astronomical assistant to the superintendent, has been employed in various ways, as signified by his title, and especially engaged as inspector of the repairing and remounting of the 26-inch equatorial, the 9.6-inch equatorial, and the prime vertical transit instrument. His report is appended, marked B.

Prof. J. R. Eastman, U. S. Navy, was chief of the department of differential observations until May 10, 1893, on which date he was assigned as chief of department of fundamental observations. He was inspector of the repairs of both the transit circle and the 5.3-inch transit instrument, and was engaged during the severe winter of 1892-'93 in determining the longitude and latitude of the new Naval Observatory, and in reducing observations for publication. His report is appended, marked C.

Prof. Edgar Frisby, U. S. Navy, chief of departments of prime vertical observations and miscellaneous extra-meridian observations, in addition to his work in these departments, was engaged, with the assistance of Prof. Brown, in completing and preparing for publication the catalogue of stars observed by the late Capt. Gilliss, U. S. Navy. His report is appended, marked D.

Prof. S. J. Brown, U. S. Navy, has been chief of the department of differential observations since May 10, 1893, prior to which date he was given charge of other departments, owing to the lack of officers. He has been principally and diligently engaged in assisting Prof. Frisby in reducing and preparing for publication the Gilliss zone observations, made at Santiago de Chile in the years 1850, 1851, and 1852. Prof. Brown's report is appended, marked E.

Commander Joshua Bishop, U. S. Navy, chief nautical assistant to the superintendent, has, in addition to the general supervision and distribution of nautical instruments, performed the duties of general storekeeper, civil engineer, pay officer, and "captain of the yard." Commander Bishop's report is appended, marked F.

Lieut. L. C. Heilner, U. S. Navy, chief of departments of chronometers and time observations, in addition to his routine work, has been engaged in perfecting the testing room for chronometers. He was assisted in his work by Ensign A. N. Mayer, U. S. Navy, and Computer Frank E. Dennett. Lieut. Heilner's report is appended, marked G.

Lieut. C. C. Marsh, U. S. Navy, is chief of department of magnetism and meteorology. The magnetic buildings were taken apart at the old observatory and reërected at the new site. The removal of these buildings, instruments, and piers, together with their remounting and adjustment, occupied the greater part of the fiscal year. Lieut. Marsh's report is appended, marked H.

The library is under the supervision of a committee composed of Profs. William Harkness, J. R. Eastman, and Assistant Librarian Mr. William D. Horigan. Assistant Astronomer H. M. Paul performed the duties of librarian until October 15, 1892, when he was succeeded by Mr. Horigan, who has since filled the position. During the fiscal year 1892-'93 the accessions were 742, viz: 599 volumes and 143 pamphlets. Of these, 311 were received as exchanges and 431 were purchased. Upon the basis of last year's report these figures indicate that the total number of volumes in the library is now about 15,000.

The following publications were distributed to the regular exchange lists:

The Washington Observations for the year 1888.
1888 : Appendix 1—Hall (Asaph) Observations of Double Stars, 1890-'91.
1888 : Appendix 2—Hoogewerff (J. A.) Magnetic Observations, 1891.
1888 : pp. D. 1-60—Meteorological Observations, 1888.
Report of the Superintendent for 1892.

The binding for the library has been falling behind for some years, and at present there are upwards of 1,500 volumes awaiting that process. During the last year we were able to bind only 79 volumes, while the unbound volumes added to the library numbered nearly 500. In September, 1892, the library was removed to the new site. Since then the books have been reclassified and arranged in their permanent places on the shelves. The index numbers in the books and on the shelves are now being changed, and the work of recataloguing has begun.

A description in detail of the buildings, instruments, and grounds of the new observatory, accompanied by plates, is being prepared, and will shortly be published as an appendix to an annual volume of observations.

Very respectfully,

F. V. McNair,
Captain, U. S. Navy, Superintendent Naval Observatory.

The Chief of the Bureau of Equipment,
Navy Department.

APPENDIX A.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the United States Naval Observatory.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
SALARIES, NAVAL OBSERVATORY.			
One assistant astronomer (R. S., p. 27, sec. 167, act Mar. 3, 1893, Vol. 27, p. 702, sec. 1)	$2,000.00		$2,000.00
Two assistant astronomers, at $1,800 each (same act)	3,600.00		3,600.00
One clerk of class 4 (same act)	1,800.00		1,800.00
One instrument-maker (same act)	1,500.00		1,500.00
One electrician (same act)	1,500.00		1,500.00
One photographer (same act)	1,200.00		1,200.00
Five computers, at $1,200 each (same act)	6,000.00		6,000.00
One assistant librarian (same act)	1,200.00		1,200.00
One copyist (same act)	900.00		900.00
One carpenter (same act)	1,000.00		1,000.00
One engineer (same act)	1,000.00		1,000.00
Four skilled laborers, one at $1,000 and three at $720 each (increase of two submitted). (same act)	3,160.00		1,720.00
Two firemen, at $720 each (same act)	1,440.00		1,440.00
Six watchmen, at $720 each (same act)	4,320.00		4,320.00
One elevator conductor (submitted)	720.00		
Eleven laborers, at $660 each (act Mar. 3, 1893, Vol. 27, p. 702, sec. 1)	7,260.00		7,260.00
Two charwomen, at $240 each (submitted)	480.00		
		$39,080.00	30,440.00
NOTE.—The additional force asked for should not be regarded as an ordinary increase, because the necessity for it arises from the organization of a new establishment. The astronomical work can not be properly performed without more assistance. The numerous buildings, tunnels, water system, elevators, and extensive heating and electric-light plants, operated by means of three boilers, two engines, and two dynamos, require constant attention both day and night.			
CONTINGENT AND MISCELLANEOUS EXPENSES.			
Miscellaneous computations (act Mar. 3, 1893, vol. 27, p. 702, sec. 1)	1,200.00		1,200.00
Professional and scientific books, periodicals, engravings, photographs, fixtures, and supplies for the library, and binding for the same (increase of $1,000 submitted) (same act)	2,000.00		1,000.00
Apparatus and instruments, and repairs of the same (same act)	2,500.00		2,500.00
Repairs to buildings, fixtures, and fences; furniture, gas, chemicals, and stationery; freight (including transmission of public documents through the Smithsonian exchange), foreign postage, and expressage; plants, fertilizers, and all contingent expenses (increase of $2,050 submitted, to equal the amount appropriated March 3, 1891, for 1891-'92) (same act)	4,550.00		2,500.00
NOTE.—*Repairs and all contingent expenses.* The amount asked for ($4,550) is the same appropriated for the year 1892. The amount for 1894 is inadequate to meet all the unforeseen contingencies occurring in connection with the occupation of a new establishment incomplete in minor details.			
Fuel, oil, grease, tools, pipe, wire, and other materials needed for the maintenance and repair of boilers, engines, heating apparatus, electric lighting and power plant, and water-supply system; purchase and maintenance of teams; material for boxing nautical instruments for transportation; paints, telegraph and telephone service, and incidental labor (increase of $2,500 submitted) (act Mar. 3, 1893, vol. 27, p. 702, sec. 1)	10,000.00		7,500.00
		20,250.00	14,700.00
NOTE.—Approximate estimates in detail viz: Coal, 900 tons, at $6 per ton, $5,400; supplies for engines, pumps, and electric-light plant, $1,350; repairs to boilers, engines, dynamos, pumps, heating and water systems, $500; purchase and maintenance of teams, $1,000; material for boxing nautical instruments, $100; paints, etc., $400; telegraph and telephone service, $250; incidental labor, $1,000.			

Estimate of appropriations required for the service of the fiscal year ending June 30, 1895, by the United States Naval Observatory—Continued.

Detailed object of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation	Amount appropriated for the current fiscal year ending June 30, 1894.
Public works, under Navy Department.			
GROUNDS AND ROADS—NEW NAVAL OBSERVATORY.			
For continuing grading, extending roads and paths, and improving grounds of new Naval Observatory, including filling ravines to Massachusetts avenue extended (to be immediately available). (Act Mar. 3, 1893, vol. 27, p. 722, sec. 1)		$12.000.00	$12,000.00
INSTRUMENTS AND ACCESSORIES.			
For miscellaneous instruments and accessories, viz: 1 comet seeker, $400; 1 standard mercurial barometer, $400; 1 magnetic theodolite, $800; 1 dip circle, $250; 1 earth inductor inclinometer, $300; 1 galvanometer, $80; 1 telescope and scale, $50; 1 quadrant galvanometer, $62; 1 compensator, $14; glass scales, $100; beam suspensions, $100; 1 photographic register, $150; 1 alt-azmuth instrument, mounted and protected from weather, $6,500; eyepieces and shades, $250· 1 12-inch object glass, $2,000, (to be immediately available). Submitted		11,456.00	
NEW NAVAL OBSERVATORY.			
For freight elevator. Submitted		500.00	
		23.956.00	16.500.00

APPENDIX B.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, September 26, 1893.

SIR: I have the honor to report that during the year ending June 30, 1893, my time has been occupied mainly by the miscellaneous duties growing out of my position as chief astronomical assistant. Respecting most of these duties it is scarcely possible to give any detailed account, because their only tangible result is to be seen in the general working of the institution. A few items may be specified as follows:

The building of the new mountings for the 12-inch and 26-inch telescopes, and the reconstruction of the prime vertical transit instrument, were effected under my supervision as inspector, and I have prepared the detailed specifications for the new 6-inch transit circle.

Starting from very small dimensions, astronomical telescopes have grown until the weight of the machinery which carries them is now reckoned in tons. So long as the parts were small it sufficed to proportion them by the eye, but when the polar axis attains the size of the screw shaft of an ordinary steamer it becomes necessary to have exact formulæ, similar to those used in the designing of steam engines. No such formulæ were available, but the Observatory library contains drawings and descriptions of nearly all the great telescopes ever made, and by a careful study of them I succeeded in making formulæ which readily give the dimensions of all the principal parts of an equatorial mounting of any possible size. The question which gave me most trouble was the determination of the proper thickness for the steel plates of the telescope tubes. No general integral can be found for the differential equations which express these thicknesses, and an expansion into series does not give sufficiently accurate results, but I finally succeeded in arranging a method by quadratures which is both simple and accurate. All the principal parts of our 12 and 26 inch equatorial mountings were designed in accordance with these formulæ, the special computations for the telescope tubes being in each case made by me, and copies of the formulæ were subsequently given to the contractors.

Into both these mountings I have introduced one feature which I believe to be entirely new, namely, a pair of dials for indicating the right ascension and declination of the point in the heavens to which the telescope is directed. A dial indicating the right ascension has been used before, but so far as I know these telescopes are the first ever provided with declination dials. Heretofore the rough setting of large equatorials has usually been effected by means of coarsely divided circles situated, respectively, upon the polar and declination axes, but great difficulty is frequently experienced in seeing these circles at night, and in any event the hour angle of the object must be computed for setting in right ascension. With the new dials all these difficulties vanish. They face the observer when his hands are upon the right ascension and declination quick motions, they are brightly illuminated, they give the same degree of accuracy as the old-fashioned coarse circles, and as the right-ascension dial is moved by clockwork it shows the apparent right ascension of the telescope, together with its hour angle, and the right ascension of the meridian. Having the right ascension and declination of any visible object, the observer can instantly bring it into the field of the finder by setting these coördinates upon the dials; and if he wishes to set closer than that, as, for instance, in the case of a faint asteroid, he can readily do so, because the eyepieces of the microscopes for reading the fine right-ascension circle are situated at the sides of the dials, and the eyepieces of the microscopes for reading the fine-declination circle are close to the clamp and tangent screws at the eye end of the main telescope. All the movements of the instrument are controlled, and all the readings of the dials and circles are made, either from the floor of the dome or from the eye end of the main telescope, thus enabling an observer to work alone without the aid of an assistant. For greater convenience in observing the sun and moon, I have introduced supplementary gearing into the driving clock by means of which the speed of the telescope can be instantly changed from sidereal to mean solar or mean lunar. This gearing was specially computed by me, and is so exact that if the telescope is running truly on sideral time, when changed to a mean solar or mean lunar rate, the errors are, respectively, only 0.80 of a second and 1.41 seconds per day.

In planning the changes of the prime vertical instrument, my aim was to make the telescope perfectly symmetrical, and at the same time to preserve all the advantages for rapid handling which pertained to the old unsymmetrical form. This has been accomplished by giving the telescope the form of an ordinary transit instrument, and so arranging the reversing carriage that it remains permanently in place, with its machinery wholly beneath the floor. A crane and telescope have also been provided for manipulating the level. The result is that the instrument can be reversed in about fifteen seconds, and an observer standing outside of the northern pier can make all the reversals and readings of the level without moving from his place. The test of actual use has proved the new instrument to be very convenient, and it is hoped that it will give rather more accurate results than the old form.

Before beginning to draw up the specifications for the new 6-inch transit circle, I made an exhaustive study of all the descriptions of such instruments contained in the library of the observatory, and I embodied the information so obtained in a series of formulæ for the determination of the sizes of all the principal parts of transit circles. The specifications for the new instrument are based upon these formulæ, supplemented by all the information which I was able to obtain from a careful examination of some of the best modern meridian circles.

Very respectfully, etc.,

WM. HARKNESS,
Professor of Mathematics, U. S. Navy.

The SUPERINTENDENT,
United States Naval Observatory.

APPENDIX C.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, August 23, 1893.

SIR: Since my last annual report I have been occupied with observations for the time service, with the work for determining the position of the new observatory with reference to the old observatory, and with the preparation of the complete results of the observations with the transit circle, for publication.

As soon as gas was introduced into the east transit circle room, in the autumn of 1892, observations for the time service were begun and continued until May 10, 1893.

In February, 1893, a portable transit instrument was mounted on the center of the transit circle pier at the old observatory and a similar instrument was placed on the pier in the west transit circle room at the new observatory for the purpose of finding the difference of longitude and latitude between the two positions. Sidereal break-circuit chronometers were used at each station for time, and the usual telegraphic method was utilized in the exchange of signals for the longitude work. In the latitude work the transit instruments were used as zenith telescopes. In the longitude observations the same stars were used at both stations. The same pairs of stars were used at each station in the latitude work. This method eliminated the errors in the star places from both coördinates, leaving only the accidental errors of observation and of the transmission of signals. The observers were Prof. J. R. Eastman and Assistant Astronomer A. N. Skinner. In the longitude work the observers exchanged stations and also used the apparatus to determine their absolute personal equations. In the latitude work Mr. Skinner made the observations at the old and Prof. Eastman at the new observatory. Eleven nights were devoted to observations for longitude, and latitude observations were made on three nights at the old and on four nights at the new observatory.

The difference of longitude between the adopted points of reference at the two sites was found to be $3.670^s \pm 0.012^s$, the new site being west of the old observatory. From the latitude observations the new site was found to be $1' \, 35.88'' \pm 0.023''$ north of the old observatory.

Assuming that the latitude and longitude, + 38° 53′ 38.80″ and $5^h\ 8^m\ 12.04^s$, of the old observatory were correct, this determination would give the position of the new observatory in latitude 38° 55′ 14.68″ north and in longitude $5^h\ 8^m\ 15.71^s$ west of Greenwich.

On account of the lack of assistance and the continuous use of the remodeled transit circle for time observations, it was impossible to thoroughly examine that instrument to determine the quality of the changes and repairs, and nothing was done in that direction further than to ascertain the apparently good character of the work done in redividing Circle B, and that the new 9-inch objective gave unsatisfactory star images.

On May 10, 1893, I was relieved of the charge of the transit circle and placed in charge of the department of fundamental work with one computer to assist in compiling the results of twenty-three years observations of stars with the transit circle.

The transit circle work for 1889 has been printed during the fiscal year ending June 30, 1893, and the proof of about half of the work for 1890 has been read.

The printer's copy of the observations and results for 1891 will be finished before September 1, 1893.

Respectfully,

J. R. EASTMAN,
Professor of Mathematics, U. S. Navy.

The SUPERINTENDENT,
United States Naval Observatory.

APPENDIX D.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, September 25, 1893.

SIR: In accordance with your instructions I submit herewith the following report of the two departments under my charge:

Department of Extra-Meridian Observations.—The 9.6-inch equatorial telescope was removed from the old observatory building in December, 1892, and placed in position at the new observatory shortly afterwards. The instrument was in use during the year up to the time of its removal in the observation of comets, occultations of stars by the moon, and one partial solar eclipse. The observations made of several comets have all been reduced and published in the Astronomical Journal.

Two nights each week the public, to whom cards of admission are granted, are permitted to visit the observatory and view the heavenly bodies through this telescope.

Department of Prime-Vertical Observations.—During the winter and spring of 1892-'93 the prime vertical transit instrument was undergoing extensive repairs. It was placed in its present position in the latter part of March, 1893, and under your order of May 10 I assumed charge of it, with Computer George A. Hill as an assistant, who was promoted to assistant astronomer May 17, 1893. Mr. Hill was instructed to supervise the placing of the illuminating apparatus in position, the running of the chronograph circuit, and the other minor details necessary before observations could be taken. In June Mr. Hill determined the value of one division of the level by repeated trials with the level trier, and adjusted the instrument for level, collimation, and azimuth, and observations were made to determine the approximate latitude of the instrument; and the result, from fifteen observations of six close zenith stars, was 38° 55′ 14.7″ north. The telescope is now in complete working order, and Mr. Hill is engaged upon continuous observations of stars.

With the assistance of Prof. S. J. Brown, the catalogue of 17,000 stars observed by the late Capt. J. M. Gilliss, U. S. Navy, when stationed at Santiago de Chile, has been completed and it is now ready for publication.

Very respectfully,

EDGAR FRISBY,
Professor of Mathematics, U. S. Navy.

The SUPERINTENDENT,
United States Naval Observatory.

APPENDIX E.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, August 25, 1893.

SIR: I have the honor to submit the following report of my work for the year ending June 30, 1893:

I was principally engaged in the reduction and preparation for publication of the Gilliss zones, made at Santiago de Chile in the years 1850, 1851, and 1852. The zone catalogue, numbering over 17,000 stars, with the exception of the introduction, was ready for the printer at the close of the year.

Owing to the detachment of nearly all the line officers on duty at the Observatory, I was in charge of the time service and east transit instrument from July 1, practically until the end of the year, assisted by Mr. George A. Hill. For the same reason I was in charge of the magnetic observatory until relieved by Lieut. Beehler, by your order, on October 1, 1892. From the beginning of the year until that time I was assisted by Computer Theo I. King. I was also given charge of the prime vertical observations made by Lieuts. C. G. Bowman and H. Taylor during the years 1881–'84, for the purpose of preparing the same for publication. A large amount of checking of their work of reduction was done by myself, assisted by Mr. Hill, but pressure of other work has so far prevented the publication of the observations.

Since May 10, 1893, I have had charge of the east transit circle, repaired and remounted. Assistant Astronomer A. N. Skinner and Computers Theo I. King and Frank B. Littell assisted in such work of investigation as was necessary to test the performance of the instrument. It was intended to take up and push to early completion the Astronomische Gesellschaft zone from 14° to 18° south declination; but as the object glass proved defective and unsuitable for the zone work, the commencement of the work is deferred until a new object glass can be procured. Many observations have been made for the determination of division errors of the circle. While incomplete, enough has been done to show that the circle is well graduated.

Computers Hill and King were my assistants in various capacities during the year, and in all practical work they were zealous and capable. Mr. King and Mr. Littell, who have been assistants to me since May 10 on the east transit circle, have shown themselves well fitted for the work of an astronomical observatory.

Very respectfully,

S. J. BROWN,
Professor of Mathematics, U. S. Navy.

The SUPERINTENDENT,
United States Naval Observatory.

APPENDIX F.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, September 23, 1893.

SIR: I respectfully submit the following report of the department of nautical instruments for the year ending June 30, 1893:

The navigation instruments were removed from the old to the new Naval Observatory in October, 1892, and such instruments have been received from time to time, examined, and sent to vessels in commission as ordered by the Bureau of Equipment. Mr. William F. Gardner, instrument maker, has been employed in the adjustment of astronomical instruments and in wiring the buildings for electrically connecting the astronomical clocks with the different instruments; also in connecting the time-service instruments with the Western Union wires and the local circuit of wires connecting the Executive Mansion, Capitol, and the different departments for correction of time at 12 o'clock noon, seventy-fifth meridian.

The observatory was closed to visitors in October, 1892. The 9.6-inch equatorial was taken down for repairs and remounted in February, 1893; and on March 2, 1893, the observatory was again opened for visitors on Tuesday and Thursday evenings for viewing the heavens through the telescope.

Very respectfully,

JOSHUA BISHOP,
Commander, U. S. Navy.

The SUPERINTENDENT,
United States Naval Observatory.

APPENDIX G.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, August 13, 1893.

SIR: I have the honor to submit the following record of the chronometer and time service department for the year ending June 30, 1893:

The department occupied quarters at the old observatory till December 27, when the chronometers were moved to the new observatory. The transit instrument was dismounted for necessary repairs, time for the chronometers and time signals being furnished by the east transit circle.

A trial of repaired chronometers was commenced April 13, and at the end of the fiscal year was still in progess. The standard mean-time clock was mounted in the chronometer room in November, 1892, and is now performing satisfactorily. I inclose a record of chronometers received, issued, and condemned during the year.

Very respectfully,

L. C. HEILNER,

Lieutenant, U. S. Navy, in charge of Chronometer and Time Service.

The SUPERINTENDENT,
United States Naval Observatory.

[Inclosure.]

RECORD OF CHRONOMETERS ISSUED, RECEIVED, AND CONDEMNED.

Issued to ships, 23 standards and 8 "hacks;" issued to shore stations, 7 "hacks;" issued to World's Fair, 7 standards and 1 "hack;" loaned to Smithsonian Institution, 1 standard; turned in to makers, 38 standards and 15 "hacks."

Received from ships, 35 standards and 10 "hacks;" received from shore stations, 1 standard and 6 "hacks;" received from makers, 40 standards and 15 "hacks."

Eight "hacks" have been condemned for sale; 5 "hacks" and 1 standard have been withdrawn from issue list to wait survey.

Two standards have been condemned for use as "hacks."

APPENDIX H.

UNITED STATES NAVAL OBSERVATORY,
GEORGETOWN HEIGHTS,
Washington, September 23, 1893.

SIR: I have the honor to submit the following report on the work done in the Magnetic Department during the year ending June 30, 1893:

As the instruments were dismounted at the old observatory and transferred to this site, along with all other instruments pertaining to the observatory, no observations or records have been taken since that time. The magnetic establishment at the old observatory was faulty in some very serious respects. The chief of these was that of regulating the temperature and moisture of the vault in which the magnetographs were mounted. The records show a range of temperature between winter and summer of more than 30° F., which range so masked the range of the magnetic elements, particularly the horizontal force and vertical force, that the reductions were only made by a most laborious process, and even when obtained were somewhat uncertain. In the buildings now about finished it is believed these faults will not exist, the vault being under ground, with double walls of brick, and air space around and above. The entrance being through a long tunnel under the main building, and the air being supplied by a long pipe extending to the ravine below, the primary sources of evil are removed. With the roof of the vault covered with cement and earth, and the heating apparatus as designed, the temperature range will doubtless be very small. The system of air supply and means of removing the moisture and controlling the temperature are briefly as follows: The air enters through a 15-inch pipe and passes through a box of broken glass, which is kept dampened with sulphuric acid, which absorbs all moisture: from thence the air passes to a small furnace with a gas stove regulated by a thermostat to the summer temperature; from the furnace the air goes by pipes to the vault and air space.

The vault has been practically finished, except the cement and earth on the roof, since the latter part of August, and the daily range of temperature has rarely exceeded 2° F.

In mounting the instruments of the magnetographs all the latest implements will be employed. The bifilar has been fitted with the best temperature compensating apparatus. The vertical force needle has been remodeled and also furnished with a new temperature bar. All needles have been subjected to an exhaustive treatment which it is hoped will render their magnetism more constant. Extensive experiments have been made to test the effect of electric lights on the instruments. The authorities at Kew, England, have been experimenting on a method of insulating the dynamo with which the Kew Observatory is to be supplied with electricity. Electric lights will replace the gas jets formerly used with the magnetographs.

The need of better instruments to determine the absolute values is imperative. It may be said that with the exception of the large declinometer none of the instruments are sufficiently accurate. The buildings are about ready for the instruments, which would now be mounted were it not that Mr. James, electrician, and myself have been engaged in reducing the records of 1892 in order to get them ready for the printer.

Very respectfully,

C. C. MARSH,
Lieutenant, U. S. Navy.

The SUPERINTENDENT,
United States Naval Observatory.

REPORT OF THE SUPERINTENDENT OF THE NAUTICAL ALMANAC.

NAUTICAL ALMANAC OFFICE,
BUREAU OF EQUIPMENT, NAVY DEPARTMENT,
Washington, D. C., September 29, 1893.

SIR: In compliance with the order of the Bureau, dated June 17, 1893, I have the honor to submit the following report of the work of this office during the past year:

PRINTING.

The American Nautical Almanac for 1896 was issued in October, 1892. The American Ephemeris for 1896 was issued in June, 1893. The American Nautical Almanac for 1897, and the Pacific Coaster's Almanac for 1894 are now in press. Of the Ephemeris and Nautical Almanac for 1897, 323 pages are now in type.

DISTRIBUTION.

During the fiscal year ending June 30, 1893, the sale and distribution of publications has been as follows:

Publications.	Sold.	Distributed.	Issued to public service.	Total issued.
American Ephemeris	638	709	507	1,854
American Nautical Almanac	2,087	....	241	2,328
Pacific Coaster's Almanac	1,335	....	66	1,401
Astronomical Papers	22	251	27	300

The proceeds of sales, amounting to $1,349.28, have, in compliance with law, been deposited in the Treasury, to the account of the appropriation for public printing and binding.

NEW TABLES OF THE PLANETS.

During the past fiscal year the work of comparing the best existing tables of the sun and inner planets with all available meridian observations of value, and forming the resulting equations of condition for correcting the elements, was substantially completed. Afterward, however, the data necessary to make the series complete up to the end of 1892 was received from the observatories of Greenwich and Strassburg, and the working up of these observations is now nearly complete. The formation of the normal equations for the solution by the method of least squares is rapidly advancing. This work would be very long and tedious in the case of equations containing about twenty unknown quantities, but special devices have been employed to shorten it.

The especial thanks of the office are due to the Astronomer Royal of England, and to Prof. Becker, director of the University Observatory at Strassburg, for the communication of the observations made at their respective institutions.

Progress has also been made in a number of investigations necessary to the construction of the new tables, some of which were mentioned in my report of last year.

(1) The reduction of meridian observations of the moon, made at Greenwich and Washington since 1862, in order to determine the solar parallax from the observed value of the moon's parallactic inequality, has been completed. The definite result is not completely worked out, but will not differ much from 8″.82.

(2) The discussion of all the observations made on the small planet Polyhymnia from its discovery in 1854 until 1888, was delayed several years, owing to the inability of the office to find a computer possessing both the skill necessary to complete the work and the willingness to do it for the small pay which the office could offer. Such a computer was, however, found during the past summer, and the most difficult part of the computations has been completed, but I have not yet been able to give the work the careful and definitive examination necessary to insure its freedom from every source of error.

(3) In order to complete the discussion of all the contact observations made at the transits of Venus in 1874 and 1882, I have felt constrained to reëxamine all the observations myself, a work which is now in progress. This work is therefore still incomplete.

(4) A development of the perturbative function of planetary motion, which was nearly completed ten years ago, has been prepared for the press, and is now being printed. This development forms the basis of all the theories of the planetary motions.

(5) The computation of the secular variations of the planetary orbits from the development just mentioned is a necessary part of the work. It has suffered some delay from the difficulty which I have experienced in working out the best methods of executing it. This difficulty has, however, been overcome, and the work is now making rapid progress.

(6) In the same connection, a computation of certain inequalities of very long period in the four inner planets, made two years ago, has been put into final shape and sent to the printer.

(7) The solar parallax being a fundamental element in all astronomical tables, its determination by all the best methods available has

necessarily formed an important part of the work. In this connection I have to report that the coöperation of Dr. David Gill, Her Majesty's astronomer at the Cape of Good Hope, has been of the greatest value. Several years ago Dr. Gill devised a method of determining the parallax by heliometer observations on such small planets as chance to approach near to the earth. Astronomical observers in both hemispheres were induced to coöperate in this work by observing Iris, Sappho, and Victoria. The reduction of the entire work in the case of these planets has been pushed to completion under the direction of its originator and the several results communicated to this office. Among Dr. Gill's coadjutors have been the Royal Observatory of Berlin, with its associated office of the Berliner Astronomisches Jahrbuch, and the Yale Observatory at New Haven.

This method, and that from the constant of aberration combined with the velocity of light, may fairly rank as the most accurate ones for the determination of the solar parallax. The results are, however, discordant to a greater extent than would have been expected, the results from the small planets being 8″.810 and that from the velocity of light, so far as the data have been worked out, about 8″.791. The photographic and heliometer observations made by Americans and Germans during the recent transits of Venus give much larger results than either. Under these circumstances it may be impossible at present to decide upon a value which all astronomers will agree to be the most probable one, and therefore best to adopt a provisional one, subject to future correction.

Very respectfully, your obedient servant,

S. NEWCOMB,
Superintendent Nautical Almanac.

The CHIEF OF THE BUREAU OF EQUIPMENT,
Navy Department.

Estimates of appropriations required for the service of fiscal year ending June 30, 1895, by the Nautical Almanac Office.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
SALARIES.			
Salaries of assistants in preparing for publication the American Ephemeris and Nautical Almanac, viz:			
Three assistants, at $1,600 each (act Aug. 5. 1892: Mar. 3. 1893)	$4,800.00		
Two assistants, at $1,400 each (same acts)	2,800.00		
Three assistants, at $1,200 each (same acts)	3,600.00		
Two assistants, at $1,000 each (same acts)	2,000.00		
One copyist and typewriter, at $900 (same acts)	900.00		
One assistant messenger, at $720 (same acts)	720.00		
One laborer, at $660 (same acts)	660.00		
		15,480.00	15,480.00
Pay of computers on piecework in preparing for publication the American Ephemeris and Nautical Almanac and in improving the tables of the planets (same act)	8,400.00	8,400.00	8,400.00

REPORT OF NAVAL INSPECTOR OF ELECTRIC LIGHTING.

NAVY DEPARTMENT, BUREAU OF EQUIPMENT,
Washington, October 2, 1893.

SIR: I have the honor to submit the following report of the work performed under the supervision of this office during the last year:

NEW ELECTRIC PLANTS INSTALLED.

The installation of electric plants has been completed and the plants tested and accepted on board the *Monterey*, *Bancroft*, *New York*, and *Detroit*. The plants of the *Olympia*, *Machias*, *Castine*, *Columbia*, *Marblehead*, and *Montgomery*, are also practically finished, though not yet finally accepted. Work has progressed on the installations of the Harbor Defense Ram and Torpedo Boat No. 2. Contracts have been awarded for the plants of the *Indiana*, *Massachusetts*, and *Oregon*.

All the material for the plants of the *Maine*, *Texas*, *Cincinnati*, *Raleigh*, and *Amphitrite* has been assembled at the New York and Norfolk navy-yards, and the work of installation is well advanced.

A large proportion of the material necessary for the *Puritan*, *Terror*, and *Monadnock* has also been procured, and the work of installation begun.

Specifications have been prepared and issued for the electric plants of the *Iowa*, *Brooklyn*, and *Minneapolis*.

ELECTRIC PLANTS OF VESSELS IN COMMISSION.

The plants of the vessels in commission have, in general, continued to operate in a satisfactory manner. Needed repairs and alterations were made in the plants of nearly all the vessels comprising the Naval Review fleet before their departure for their cruising stations.

The *Concord* and *Bennington* have had the generating sets originally supplied them by the contractors, and which were not accepted on account of their inefficiency, replaced by new sets of the latest design and type, and the plants of both vessels are in good condition.

The generating set of the *Dolphin*, an experimental one which had given much trouble, and which had too small a capacity to supply the additional number of lights required by alterations in the vessel, has been replaced by one of the latest type.

New generating sets have been purchased for the *Atlanta* and *Boston* and it is proposed to install them and to partially renew fixtures and wires at the first opportunity. Both of these vessels have at present, sets of the belted type, with dynamos not of the standard voltage and their fixtures and wiring accessories are of obsolete patterns.

STANDARD APPARATUS.

The work of standardizing all material used in the electric plants of naval vessels has been continued and specifications for standard electrical apparatus, and for the installation of the same on board vessels of the Navy, have been prepared, printed, and issued. It is proposed to revise these specifications yearly, so as to keep their requirements up to the latest and best practice. The new type of generating set alluded to in the report of last year has been developed and a number of sets have been installed in new vessels. Thus far these sets have given very satisfactory results, and it is believed that they compare more than favorably with any as yet designed for naval use.

SEARCH LIGHTS.

The projectors previously contracted for by this Bureau have been completed, tested, and supplied to the new ships as they needed them. Three vessels, viz, the *Monterey*, *New York*, and *Columbia*, have projectors fitted with a device for operating them from a distant point by means of electric motors. Sufficient experience has not been had with them as yet to enable a decision to be reached as to the practical value of such control.

Investigations and experiments are going on with the view of developing a smaller and lighter projector, and a better form of lamp, and possibly, of mirror, for the search lights which will be required for such of the vessels now building as have not been supplied.

TESTING STATION.

The need of proper facilities for making tests of electrical apparatus and material having long been felt, a testing station has been established and gradually equipped with instruments and other appliances for making electrical tests in the equipment department of the New York navy-yard.

It is now in a condition to make measurements and tests of nearly every description required for the naval service.

The constant employment at the navy-yards of a small number of mechanics skilled in electrical work has proved to be most advantageous in making repairs to the electric plants of vessels in commission, both as regards expense and quality of work. Excellent work is also being done by this force in the new ships which are being built at the navy-yards.

RECOMMENDATIONS.

It is earnestly recommended that the rate of electrical machinist be established, the pay of the rating to be such as will compensate intelligent and competent men and lead such to seek the position, the rating to be open to any enlisted man possessing the necessary qualifications and experience.

As the duties of these men are more constant than those of any other force of mechanics on board ship, are performed under extremely arduous and trying circumstances of heat and crowded space, and require them to operate continuously and keep in repair machinery and apparatus of the highest type, their rate of pay should surely not be less than that of other artificers in the ship having similar but no more responsible duties.

It is also recommended that the services of a draftsman be obtained permanently for this Bureau.

Respectfully submitted.

W. MAYNARD,
Lieutenant Commander, U. S. Navy,
Naval Inspector of Electric Lighting.

The CHIEF OF BUREAU OF EQUIPMENT, NAVY DEPARTMENT.

REPORT OF SUPERINTENDENT OF COMPASSES.

NAVY DEPARTMENT, BUREAU OF EQUIPMENT,
Washington, D. C., October 2, 1893.

SIR: I have the honor to submit the following report of the work of this office for the past year:

The instruments purchased for the Navy comprise twenty-seven new boat service (4-inch) compasses, from Ritchie & Sons, six heeling magnet correctors from Ritchie & Sons, eighteen cases magnetic instruments, each containing one horizontal vibrating instrument and one heel adjusting instrument, from Queen & Co., one pelorus, from Negus, twelve peloruses from Bliss & Co.

In addition to the above, six brass chain boxes and twenty-four 7-inch D-corrector spheres have been manufactured at the New York navy-yard.

One thousand copies of Practical Problems and the Compensation of the Compass in the United States Navy, by Lieut. S. W. B. Diehl, U. S. Navy, have been received from the Government Printing Office and issued to vessels in service and to officers requesting them. This book deserves especial mention as presenting the subject of compensation in a thoroughly practical manner, with actual examples occurring in our service, and reflects great credit upon the zeal and efficiency of the author.

Fifty copies of the Admiralty Manual (new edition) have been ordered through the United States dispatch agent in London, but have not yet been received.

Repairs have been made to sixty seven service (7½-inch) compasses, to ninety-five boat service (4-inch) compasses, and to twenty-four azimuth circles, seven of the last mentioned having been converted to the new Type III azimuth circle; all the above by Ritchie & Sons.

Twenty-five new binnacles, Type III, modified, have been ordered from Ritchie and are nearly ready for delivery. These, with twenty-four brass chain boxes for D-correcting chain and twelve supporting tables, to be furnished by Ritchie, and some Flinders rods, comprise the additions made to the instruments under the cognizance of this office.

The modification of the Type III binnacle consists in having the base ring, standard, compass, chamber, and arms all in one casting, securing greater solidity.

Chain boxes have been adopted for use in cases where the coefficient D is small.

Compasses have been relocated on board the *Concord*, *Bennington*, and *Dolphin*, owing to changes in construction. Compasses have been located on board the *Machias* and *Iwana*, and tentatively on board the *Detroit* and *New York*.

Approximate compensation has been made by the office on board the *Iwana*, *Dolphin*, *Bennington*, *Concord*, and *New York*.

Certain changes have been made in local masses on board the *Machias*, *Castine*, *Detroit*, *Montgomery*, and *Marblehead*, and approximate locations for compasses have been suggested on board the vessels planned by the Department.

A number of officers under orders from the Department have been instructed during the year in practical compensation of the compass.

Compass reports, magnetic surveys, and observations relative to the compass have been received from vessels in commission, examined, discussed, and placed on file.

Experiments have been conducted constantly in the office.

During the year the following officers have been connected with this office: Lieuts. Diehl, Gillmore, and Muir, and Ensign Buchanan, all of whom have ably assisted in the performance of the exacting duties.

I would respectfully recommend that a small amount be appropriated for the purchase of experimental instruments. New devices are constantly appearing in the field both in this country and abroad, and it would be well to keep pace with all improvements.

I would respectfully call attention to the meager office accommodations; one room in the basement, the walls lined with lockers containing files of equipment letters, now serves as record room, model room, school room, and office of the superintendent of compasses. It is wholly inadequate for all these purposes; its distance from the Bureau proper is a great disadvantage, and it has little or no attention. It is incommensurate with the dignity of the subject treated, and to the occasional visitor must evidence a slight regard for one of the most important and serious factors in the navigation of ships at sea.

Very respectfully,

C. P. PERKINS,

Lieutenant, U. S. Navy, Superintendent of Compasses.

The CHIEF OF BUREAU OF EQUIPMENT

APPENDIX.

REPORT OF LIEUT. C. F. POND ON THE MARE ISLAND OBSERVATORY.

NAVY-YARD, MARE ISLAND, CAL., *July 15, 1893.*

SIR: In obedience to Bureau's order of June 21, 1893, No. 2234, I have the honor to submit the following report of the operations of the Mare Island Observatory for the fiscal year ending June 30, 1893:

The following is the extent and condition of the observatory plant:

BUILDINGS.

(1) Clock and chronometer room, brick, double walls, ceiled, waterproofed, 18 by 18 feet by 10½ feet high, 16 feet to peak of roof; roof space ceiled off. Erected 1884.

(2) Transit room, wood, ceiled, 17 by 18 feet by 7½ feet high, 13 feet to peak of roof. Erected 1893.

(3) Battery room, wood, ceiled, 8 by 5 feet by 7½ feet high. The new transit room and battery room adjoining will be more fully described further on.

(4) Equatorial building, two stories, brick, ceiled, 21 by 18 feet by 18 feet high; surmounted by sheet-iron dome 12 feet in diameter. The lower floor is used for an office.

All the buildings are in excellent condition excepting slight repairs needed about windows of equatorial building and the dome, which, originally made too weak and out of shape, was further badly injured in a violent windstorm of last winter.

INSTRUMENTS.

In clock room.—1 standard mean time clock, Howard, No. 624; 1 standard sidereal time clock, Howard, No. 627; 1 transmitting clock, Howard, No. 622; 1 sidereal break circuit chronometer, Negus, No. 1178; 1 chronograph; 1 standard barometer, Green, No. 1366; 2 standard thermometers, Green; 2 maximum minimum thermometers, Green; 1 psychrometer, Green.

In transit room.—1 transit instrument, portable, broken back, Stackpole, No. 1508, 1 transit instrument, portable, Würdeman, No. 29, in reserve, 1 sidereal chronometer, Poole, No. 1447, used as finder.

In equatorial room.—1 equatorial instrument, 5 inches, A. Clark & Sons.

Miscellaneous.—1 Gardner clock, in use at gate; 1 theodolite magnetometer and alt-azimuth, Fauth & Co., No. 1; 1 dip circle, Barrow; 1 field glass; 1 time ball and detaching apparatus, batteries, relays, repeaters, sounders, keys, switches, etc., for time service and transit work, including a complete set of instruments for longitude work. All instruments are in excellent condition.

The routine of work is as follows:

Daily: 11 a.m. Wind and compare chronometers. Compare mean time and sidereal clocks and sidereal chronometer with sidereal clock. Chronometers and clocks are compared on the chronograph. Record on rough sheets maximum and minimum temperature of chronometer case and dry and wet bulb thermometers in clock room.

Record in "clock correction book" mean barometer for preceding twenty-four hours.

Barometer readings furnished from U. S. S. *Independence* and reduced to 32° F. and corrected for height and error of *Independence's* barometer.

11:30 a. m. Set transmitting clock to correct one hundred and twentieth meridian time.

11:50 a. m. to 12 m. Send out time.

12 M. Noon signal sent out and local time ball dropped, and, one second later, navy-yard bell struck.

P. M.: Read off chronograph sheet, viz: Chronometer and clock comparisons and noon signal.

Enter in "temperature book," from rough sheets, maximum and minimum and mean temperature, and dry and wet bulbs and their difference, for preceding twenty-four hours.

Weekly: Monday, 11 a. m., wind clocks and sidereal chronometer (finder) in transit room.

Record in "clock correction book" maximum and minimum temperature in mean-time clock case.

Tenth day: Each tenth day is "term day."

A. M. After winding turn each chronometer 90° in azimuth to the right.

First "term day" of each month mark hour and minute of each chronometer when compared. Do this also for each chronometer the day when received or issued.

P. M., or after next sight night: Work up correction and ten-day rate and variation of daily rate of each chronometer, mean temperature, variation of daily temperature of chronometer case and mean relative humidity of chronometer room and enter these quantities in the "ledger" for each chronometer. Plot temperature rate curves of all chronometers available for issue.

Monthly: First of each month make out daily comparison sheet for each chronometer.

Quarterly: At end of each quarter make out and forward to Bureau quarterly report of chronometers.

Semiannually: At beginning of each half year make out rough sheets for maximum and minimum temperature of chronometer case and dry and wet bulb thermometers in chronometer room.

Annually: Submit annual report to commandant at end of fiscal year.

Occasionally: Make transit observations for rating clocks every third night or as often as necessary and as weather will permit. Work up sights next morning in time for sending out time.

Record in "instrumental constant book" the instrumental constants derived from the sights.

Record in "clock correction book" corrections and rates of clocks from observations, and interpolate from observed rates and daily comparisons (paying attention to barometer) the corrections and rates for noon of each day since last preceding sights; also enter "difference by comparison" and "second difference." The rate for sidereal o'clock is the sidereal rate for the interval of a mean time day.

Work up in "record of noon signal book" the error on one hundred and twentieth meridian time of noon signal for each day since last preceding sights.

When chronometers are received, issued, cleaned, repaired, etc., make proper record on daily comparison sheets, in "ledger" and "chronometer history book."

TIME SERVICE.

The principal work of the observatory is in connection with the time service. During the year 964 transits of standard stars have been observed on 91 nights.

The growth of the Pacific coast time service during the year in number of clocks installed, in extent of territory covered and in popular favor has been very satisfactory.

The following extracts from a letter of Frank Jaynes, superintendent Western Union Telegraph Company, of date July 14, 1893, are pertinent:

> The time signals from the United States Observatory (Mare Island) are sent eastward on the line of the Atchison, Topeka and Santa Fe Railroad to Barstow, Cal., and on the Union Pacific system to Moscow, Idaho; on the Northern Pacific Railroad to Spokane, Wash., and on the Central Pacific to Reno and Virginia City, Nev.
>
> To the northward we send the signals to Seattle, Wash., and on the south to San Diego, Cal.
>
> We have about nine hundred clocks installed in the time service at fifty-four cities and towns in California, Washington, Oregon, Idaho, and Nevada, and distribute your noon signals daily over 3,700 miles of route.
>
> Concerning the time signals distributed upon this coast, I would say that this company uses exclusively those furnished from the United States Naval Observatory at Mare Island for transmission over its lines to points mentioned in the foregoing.
>
> It may be of interest to note that when the time service commenced through the medium of our clocks, the public regarded the signals with little favor or confidence, but as the remarkable accuracy of the signals was observed day after day, a feeling of confidence has been created in the public mind which has caused the signals to become very popular. The people are now depending upon the time service to a greater extent than is generally realized; it has become almost a necessity, the loss of which would be seriously felt.
>
> The Western Union Telegraph Company have upon several occasions during the past two years transmitted the noon signals to Seattle and Port Townsend, Wash., to enable the revenue cutters and other United States ships to compare their time and regulate their chronometers prior to their departure for Alaska or Bering Sea; in fact, it appears to be now considered a necessary precaution for United States ships to make this comparison before sailing for northern points.
>
> Our part of this service has been cheerfully and gratuitously performed in recognition of the fact that the matter is one of public benefit, as well as in appreciation of the courtesy received by this company from yourself and predecessors in charge of the observatory.

The clocks referred to above are those of the Self-Winding Clock Company, New York.

The system is the same as obtains in the East, the clocks being arranged in groups according to locality, the master clock of each group being corrected daily by the direct observatory signal, the clocks in local circuit being synchronized at any hour by the master clocks.

In my annual report for 1891 the number of clocks reported installed was 400; in 1892 760, and this year 900, showing a steady and satisfactory extension of the service.

The time signals sent out are all recorded on the chronograph, the beats of the standard mean-time clock being recorded at the same time. The circuits are so arranged that the signals as recorded on the chronograph are received from the Western Union relay.

The error of noon signal in the records of the observatory is, therefore, the error as it leaves the observatory on the Western Union line; also only the signals that go out are recorded, and any interference on the line while signals are going out is recorded graphically on the chronograph sheet.

The time signals from this observatory have been specially utilized during the past year at San Diego, Cal., by the U. S. S. *Thetis* in her longitude work along the west coast of Lower California, comparisons being made with a break circuit chronometer on a chronograph placed in circuit in the Western Union office; at Port Townsend, Wash., by U. S. Coast and Geodetic Survey steamer *Patterson* on her way to and from Alaska, in connection with her longitude work, and by vessels of the Bering Sea fleet while in Puget Sound.

The following table shows the limits within which the noon signal has been sent out during the year:

ERROR.

Month.	s. s. .0-.09	s. s. .1-.19	s. s. .2-.29	s. s. .3-.39	s. s. .4-.49	s. s. .5-.59	s. s. .6-.69	Total.	Failed.
1892.									
July	13	8	1	1	2			25	
August	14	10	3					27	
September	22	3	1					26	
October	14	5	3	1				25	
November	19	2	3					24	1
December	12	5	3	2	1	1		24	2
1893.									
January	15	5	5					25	
February	17	4	2					23	
March	14	5	4	1	1		1	26	1
April	7	4	5	5	4			25	
May	9	10	6	1				26	
June	11	4	5	5	1			26	
Total	167	65	40	18	10	1	1	302	4

Of the four failures, three were caused by the Western Union line being down November 30 to December 2 on account of a violent storm; the last failure, March 15, was from some unknown fault on the Western Union line.

TIME BALLS.

The time balls on Telegraph Hill, San Francisco, and at this station are dropped daily at noon, one hundred and twentieth meridian time, Sundays and holidays excepted.

The ball at this station is dropped directly by the transmitting clock. The one at San Francisco is under charge of the Branch Hydrographic Office in that city and is dropped by the signal over the Western Union wire through the Branch Hydrographic Office An excellent chronometer in that office is kept carefully rated, and in case of failure of signal the ball is dropped from the Branch Hydrographic Office by chronometer time.

With the establishment of branch hydrographic offices in Portland, Oregon, and Port Townsend, Wash., time balls should be established in those ports to be dropped by signal from this observatory.

NAVY-YARD TIME SERVICE.

The fire-alarm service of the navy-yard is connected with the Observatory, the mechanism which works it being placed at the box containing the time-ball detaching apparatus.

The attendant at the ball, just as it drops, sets off the alarm which rings "twelve" on the large yard bell and a gong at the marine barracks, hospital, Independence, steam engineering, gate, and various other points, the first stroke coming in about one second after the ball drops, so as not to confuse observers watching the ball.

CLOCKS.

As shown by the foregoing record, the clocks have continued to perform exceedingly well.

The two standard clocks are mounted on solid brick piers, built up from bed rock, 10 feet 6 inches apart and facing at an angle of 45 degrees with each other. These piers are capped with a solid block of granite, to which the clocks are mounted and from which they are plumbed. The piers do not touch the floor.

Inclosing each clock and pier is a double outer case of two thicknesses of three-eighths inch pine having a one-half inch air space between them within which is a diaphragm of baize. They are supported by the piers, are 3 feet by 2 feet 8 inches by 5 feet 5 inches in size, and extend to within 11 inches of the floor. This outer case gives two inclosed air spaces entirely surrounding the clock case and pier, adding considerably to the uniformity of temperature within the inner case. In front of the dial plate and of the make circuit attachment are circular, double, glass plates, which allow these parts to be seen.

The transmitting clock, the rate of which is not so important, is bolted with through bolts to the wall of the room on the south side. It also performs well.

A small brass rod attached to the screw which raises and lowers the mercury of the make-circuit attachment in each of the two standard clocks projects through the outer case and has a milled head on the outer end. By this arrangement the circuit can be made or broken without opening the clock case, and the surface of the mercury being disturbed by the pointer on the pendulum only while the circuit is actually in use, the consequent oxidation, which was a frequent cause of annoyance, is thereby avoided.

The clock cases are now opened only once a week, when the clocks are wound at 11:30 a. m. Mondays, at which time the maximum and minimum temperature is recorded. The weekly range averages less than 5 degrees.

A record of the barometer is also kept. During eight months of the year there is very little fluctuation of the barometer other than the daily tides, but during the winter months this record assists materially in predicting the rate of the standard mean-time clock between sights.

CHRONOMETERS.

The following table shows the number of chronometers on hand, received, issued, and cleaned during the year:

	Box.	Hack.	Total.
Chronometers on hand June 30, 1892	27	13	40
Chronometers received during the year	22	3	25
Total	49	16	65
Chronometers issued during the year	14	4	18
Chronometers on hand June 30, 1893	35	12	47
Chronometers cleaned during the year	15	3	18

The chronometers in store are all compared daily at 11 a. m. with the standard mean-time clock.

Comparisons are made in regular order on the chronograph and are made on any ten seconds of the chronometer, a conventional signal denoting which second is marked.

Fifty chronometers can thus be most accurately compared in seven or eight minutes, and the constant daily practice of marking time must add to the efficiency of an observer with the transit.

The chronograph sheet is read off in the afternoon in about fifteen minutes.

MISCELLANEOUS.

Barometer comparisons have been furnished several vessels, and the facilities of the Observatory have been utilized by the officers of the U. S. S. *Thetis* and the U. S. Coast and Geodetic Survey Steamer *Patterson* in their preparations for field work with the transit magnetometer and dip circle.

NEW TRANSIT ROOM.

The old transit room, erected in 1875 at a cost of $250, and reported by the "Commission on Navy-Yards" in 1883 as in bad condition and valued at $75, has this year been torn down and replaced by a substantial and larger structure perfectly fitted in every respect for its work.

The new building is on brick foundation, but built of wood to more quickly take up the temperature of the outside air after nightfall. Considerable floor space was gained by extending the building to the full width of the clock and equatorial buildings adjoining, and by omitting the ends, it being built into the adjoining buildings.

By raising height of eaves from 5 to 7½ feet the full floor space can be utilized. The room is ceiled throughout and is beautifully finished in natural wood. The ridge pole where it crosses the transit slots is not entirely cut away, but reduced in thickness so as not to interfere with the observation of zenith stars, and the roof is further supported by tie beams and brackets. The old pier, consisting of a block of granite set about 3 feet in the adobe ground, was removed and three new piers built, each 9 feet 8 inches high, 4 feet square at base, and 2 feet 1 inches by 2 feet at top. These piers extend 5 feet below the surface, stand on a very solid hard-pan foundation, and are in a wide trench so as to be entirely removed from the adjacent surface adobe.

One pier is for the transit instrument in use, one for the use of surveying parties fitting out at this station, and the third, 7 feet south of the first mentioned, close to south wall of room, is for a collimator or may be used in conjunction with the second for various instrumental work.

The two transit slots extend down the sides of the room to the level of the piers, affording a full sweep of 180 degrees for the transits and providing at the same time four windows. These windows are fitted with inside blinds, and the covers to the transit slots, which are of glass, are painted on the inside so that the piers and instruments may be protected from the direct sun's rays. The covers for the transit slots are fitted, one set to slide and one hinged to throw back, and both sets are provided with counter-balance weights so as to be very easily worked.

There are two electric lights at each transit pier, one for illuminating the field of the transit, one for reading the level and finding circle. These lights are fitted with Reis regulating sockets, by which any desired degree of light may be had from a dim glow to full power of the lamp.

The light over the desk may be manipulated from either pier. Between the transit slots on the north side of the building is a vestibule which served as a battery room. This room has an electric light and is also fitted as a "dark room" for photographic work. A twenty-wire cable leads from battery room to clock room. The wires are visible only at the terminals, which are so arranged that all leads can be readily traced. While new transit room and piers were under construction the transit was temporarily mounted, March 6 to April 22, on a pier outside, in an astronomical tent kindly loaned by Lieut. Commander W. I. Moore, commanding U. S. Coast and Geodetic Survey steamer *Patterson*.

PERSONNEL.

Lieut. D. P. Menefee, U. S. Navy, continued on duty as assistant until March 15, 1893, when he was detached and ordered to duty in connection with the electric-light plant of the *Monadnock*. His work was marked by neatness and exactness and his services are much missed.

There is ample work for an assistant.

I am, sir, very respectfully,

CHAS. F. POND,
Lieutenant, U. S. Navy.

The COMMANDANT,
Navy-Yard, Mare Island, Cal.

REPORT

OF

THE CHIEF OF THE BUREAU OF NAVIGATION.

BUREAU OF NAVIGATION,
NAVY DEPARTMENT,
Washington, D. C., October 13, 1893.

SIR: I have the honor to submit herewith a report (marked A) of the movements and duties of the ships of the Navy during the past year, a copy (marked B) of the report of the superintendent of the Naval Academy, a copy (marked C) of the report of the commandant of the Training Station, and a copy (marked D) of the report of the hydrographer to the Bureau of Navigation.

Estimates for the support of the Bureau, the Naval Academy, the Training Station, the Naval War College and Torpedo School, and the Hydrographic Office are also submitted (marked E).

During the year the *New York*, *Monterey*, *Detroit*, *Machias*, and *Bancroft* have been commissioned for service. The *Atlanta*, *Constellation*, *Essex*, and *Alert* have been put out of commission.

In accordance with the provisions of the postal subsidy act, approved March 3, 1891, and at the request of the Postmaster-General, eight American steamships have been inspected, tested for speed, and classified since October 25, 1892.

During the fiscal year ending June 30, 1893, 4,350 men and 646 apprentices were enlisted or reënlisted in the Navy—1,067 men on board of cruising ships, 3.012 men and 646 apprentices on board of receiving ships and at ports where there are naval stations, 144 men for the Coast and Geodetic Survey, and 127 men for the vessels of the Fish Commission; 1,777 men and 1,004 boys, candidates for enlistment on board of the receiving ships, were rejected for physical disqualifications, and 4,192 men and 173 boys were rejected for other causes; 3,202 men and 422 apprentices were discharged—2,156 by reason of expiration of enlistment, 140 for disability, 174 by reason of services being no longer required, 756 at their own request, 129 men by request of their commanding officers, 107 for bad conduct, 53 on account of illegal enlistment, and 109 for inaptitude; 939 men and 320 apprentices deserted during the year. Of this number 776 men and 303 apprentices deserted in home ports. Forty-two men and 6 boys died.

The number of enlisted men serving under continuous-service certificates June 30, 1893, was 1,640.

Four thousand three hundred and eighteen dollars and fifty cents have been paid to enlisted men in prizes for target practice with great guns, machine guns, and small arms during the fiscal year ending June 30, 1893.

Under sections 4756 and 4757 of the Revised Statutes, 26 pensions have been allowed and 15 disallowed.

The constant demand for vessels to protect American interests makes it necessary that our squadrons in foreign waters shall be increased as rapidly as the vessels now under construction become available. Twelve of these vessels will be completed by the end of the present fiscal year, but it will be impossible to commission them for service unless the enlisted force of the Navy is increased.

Your attention is invited to the necessity of a law which will enable enlisted men of the Navy to become citizens of the United States without forfeiting their continuous service in the Navy.

Under section 1573 of the Revised Statutes and the Regulations of the Navy, men must reënlist within three months after each discharge in order to obtain the benefits of honorable discharge and of continuous service. It is most desirable that all enlisted men of the Navy shall be continuous-service men, and it seems but just that the privileges granted to enlisted men of the Army by section 2166 of the Revised Statutes shall also be granted to the enlisted men of the Navy.

In 1890 a seaman gunner, educated by the Government, after seven years continuous service, was refused citizenship in New York. In the same year a man who had served more than twenty-one years in the Marine Corps was refused citizenship in the District of Columbia. The Commissioner of Pensions has, under the act of March 1, 1893, suspended the payment of a pension awarded under section 4756 of the Revised Statutes to a man who has served in the Navy more than twenty-one years.

It is found from the records of the Naval Academy that the law passed March 2, 1889, increasing the age limit of candidates for admission to that institution, has not been beneficial. The average age at admission of the cadets who have completed the six years' course during the past five years was 16 years and 8 months. The average age of candidates for admission who were rejected mentally, during the same years, was 17 years and 7 months. The average age of the twenty-six candidates who were rejected mentally in the recent examination for admission, September 2, was 17 years and 11 months.

The efficiency of the service requires some legislative action in regard to its personnel. It is most important that officers shall reach command rank while in the prime of life. The necessity which now exists of regularly ordering officers to perform the sea duties of a higher grade than the rank they hold, thereby increasing their actual expenses without giving them the increased rank and compensation of the position in which they are serving, has an injurious effect upon the Navy.

Very respectfully,

F. M. RAMSAY,
Chief of Bureau.

The SECRETARY OF THE NAVY.

A.

DETAILED STATEMENT SHOWING THE COMPOSITION OF THE SQUADRONS AND THE DUTIES PERFORMED BY EACH VESSEL.

THE NAVAL REVIEW FLEET.

Organized March 1, 1893; disbanded May 31, 1893. Rear-Admiral Bancroft Gherardi, U. S. Navy, commander in chief U. S. flagship *Philadelphia*.

First squadron.—Rear-Admiral A. E. K. Benham, U. S. Navy, commanding. Flagship *Newark*, *Atlanta*, *San Francisco*, *Bancroft*, *Bennington*, *Baltimore*.

Second squadron.—Rear-Admiral John G. Walker, U. S. Navy, commanding. Flagship *Chicago*, *Yorktown*, *Charleston*, *Vesuvius*, *Concord*, *Miantonomoh*.

Torpedo boat *Cushing*.

SQUADRON FOR SPECIAL SERVICE.

Organized September 22, 1892; disbanded March 1, 1893. Rear-Admiral Bancroft Gherardi, U. S. Navy, commander in chief. Flagship *Baltimore*, *San Francisco*, *Charleston*, and *Yorktown*.

NORTH ATLANTIC SQUADRON.

(Disbanded during the continuance of the naval review fleet.) Rear-Admiral John G. Walker, U. S. Navy, commander in chief, until March 1, 1893. Rear-Admiral A. E. K. Benham, U. S. Navy, commander in chief from May 31, 1893. Flagship *San Francisco*, *Miantonomoh*, *Atlanta* (put out of commission July 18, 1893), 1893), *Kearsarge*, *Vesuvius*, *Concord*, (transferred to Asiatic station June 28, 1893), *Philadelphia* (transferred to Pacific squadron June 10, 1893), and *Chicago* (transferred to European squadron June 10, 1893).

ASIATIC SQUADRON.

Rear-Admiral D. B. Harmony, U. S. Navy, Commander-in-Chief. Relieved on June 7, 1893, by Rear-Admiral John Irwin, U. S. Navy. Flagship *Lancaster*, *Marion*, *Monocacy*, *Palos* (sold at public auction January 25, 1893), and *Petrel* (transferred for temporary duty with the Bering Sea fleet May 10, 1893), *Concord*, and *Alert* (put out of commission at Mare Island, California, October 10, 1893.

PACIFIC SQUADRON.

Rear-Admiral George Brown, U. S. Navy, Commander-in-Chief. Relieved on January 9, 1893, by Rear Admiral Joseph S. Skerrett, U. S. Navy. Flagship *Boston*, *Mohican* (transferred for temporary duty with Bering Sea fleet April 21, 1893), *Adams*, *Alliance*, *Ranger* (transferred for temporary duty with Bering Sea fleet April 21, 1893), *Monterey*, *Yorktown*, and *Philadelphia*. The *Charleston*, under orders to join the station, arrived at Rio Janeiro, Brazil, September 27, 1893.

SOUTH ATLANTIC SQUADRON.

(Disbanded during the continuance of the naval-review fleet). Rear-Admiral A. E. K. Benham, U. S. Navy, Commander-in Chief until March 1, 1893. Rear-Admiral O. F. Stanton, U. S. Navy, Commander-in-Chief from August 1, 1893. Flagship *Newark*, *Yantic*, *Bennington* (transferred to naval-review fleet March 1, 1893), and *Essex* (put out of commission at the Norfolk navy-yard June 13, 1893). The *Detroit* was assigned to the squadron September 11, 1893.

EUROPEAN SQUADRON.

Rear-Admiral HENRY ERBEN, U. S. Navy, Commander-in-Chief from June 10, 1893. Flagship *Chicago* and *Bennington.*

BERING SEA SQUADRON.

Commander NICOLL LUDLOW, U. S. Navy, in command. *Mohican, Ranger, Petrel* (transferred for temporary duty with Bering Sea fleet April 21, 1893), *Albatross* (temporarily transferred from the U. S. Fish Commission, May 15, 1893). By order of the Secretary of the Treasury the revenue cutters *Rush, Corwin,* and *Bear* were placed under the orders of the officer commanding this squadron April 21, 1893.

FIRST RATE.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
New York, Capt. J. W. PHILIP, U. S. Navy, commanding.			*Knots.*	
Cramp's shipyard, Philadelphia, Pa.	....	Sept. 6, 1893	....	Placed in commission Aug. 1, 1893.
Navy-yard, League Island, Pa	Sept. 6, 1893	Sept. 18, 1893	7	
Cape Henlopen	Sept. 19, 1893	Sept. 21, 1893	80	Proceeded to navy-yard, Norfolk, Va.
Hampton Roads, Va	Sept. 21, 1893	....	155	Proceeded to navy-yard, New York.

SECOND RATE.

Baltimore, Capt. W. R. BRIDGMAN, U. S. Navy, commanding.				
San Diego, Cal	Sept. 27, 1892	Oct. 7, 1892		Flagship of squadron for special service.
Redondo, Cal	Oct. 7, 1892	Oct. 10, 1892	86	Rear-Admiral Bancroft Gherardi, U. S. Navy, Commander-in-Chief.
Mazatlan, Mexico	Oct. 15, 1892	Oct. 18, 1892	986	
Acapulco, Mexico	Oct. 21, 1892	Oct. 24, 1892	552	
San José de Guatemala	Oct. 27, 1892	Nov. 5, 1892	537	
Panama, United States of Colombia.	Nov. 10, 1892	Nov. 19, 1892	936	
Callao. Peru	Nov. 26, 1892	Dec. 11, 1892	1,363	
Valparaiso, Chile	Dec. 16, 1892	Dec. 26, 1892	1,325	
Off Cape Pillar, Chile	Dec. 31, 1892	Dec. 31, 1892	1,215	
Puntas Arenas, Chile	Jan. 1, 1893	Jan. 3, 1893	1,485	
Montevideo, Uruguay	Jan. 9, 1893	Jan. 23, 1893	1,290	
Barbados, West Indies	Feb. 12, 1893	Feb. 13, 1893	3,975	
St. Thomas, West Indies	Feb. 15, 1893	Feb. 18, 1893	410	
Lynnhaven Bay	Feb. 23, 1893	Feb. 24, 1893	1,206	
Hampton Roads, Va	Feb. 24, 1893	Feb. 26, 1893	15	Transferred to naval-review fleet Mar. 1, 1893.
New York	Feb. 27, 1893	Mar. 30, 1893	270	Took part in naval rendezvous and review.
Hampton Roads, Va	Mar. 31, 1893	Apr. 4, 1893	270	
Do	Apr. 6, 1893	Apr. 12, 1893	200	
Do	Apr. 15, 1893	Apr. 24, 1893	120	
New York	Apr. 25, 1893	Sept. 25, 1893	280	Assigned to Asiatic squadron.
Chicago. Capt. J. F. MCGLENSEY, U. S. Navy, commanding. Relieved by Capt. A. T. MAHAN, U. S. Navy, May 11, 1893.				
La Guayra, Venezuela	Sept. 19, 1892	Oct. 26, 1892	499	To protect American interests.
St. Thomas, Danish West Indies.	Oct. 28, 1893	Nov. 5, 1893	1,430	Flagship North American squadron until Mar. 11, 1893.
New York	Nov. 11, 1892	Mar. 13, 1893	279	Transferred to naval-review fleet.
Hampton Roads, Va	Mar. 15, 1893	Apr. 4, 1893		
Lynnhaven Bay, Va	Apr. 4, 1893	Apr. 6, 1893		
Hampton Roads, Va	Apr. 6, 1893	Apr. 11, 1893		
Cherrystone Light House, Chesapeake Bay.	Apr. 11, 1893	Apr. 13, 1893		
Hampton Roads, Va	Apr. 13, 1893	Apr. 24, 1893	....	Took part in naval rendezvous and review.

SECOND RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
North River, N. Y. (Seventieth street).	Apr. 25, 1893	May 23, 1893	235	
Navy-yard, New York	May 23, 1893	June 17, 1893	5	
Lower Bay, New York Harbor	June 17, 1893	June 18, 1893	18	Flagship European station.
Queenstown, Ireland	June 30, 1893	....	3,129	
Philadelphia, Capt. A. S. BARKER, U. S. Navy, commanding.				
New York	Sept. 25, 1892	Sept. 29, 1892	....	North Atlantic station until Mar. 1, 1893.
Tompkinsville, N. Y	Sept. 29, 1893	Oct. 1, 1892		
North River, N. Y. (off Thirty-fourth street).	Oct. 1, 1892	Oct. 7, 1892	8	Transferred to naval review fleet.
Tompkinsville, N. Y	Oct. 7, 1892	Oct. 11, 1892	8	
Gravesend Bay	Oct. 11, 1892	....do	4	
North River, N. Y. (off One hundred and twenty-third street).	....do	....do	17	
Off Bedloe's Island	....do	Oct. 12, 1892	10	
North River, N. Y. (off Fiftieth street).	Oct. 12, 1892	Oct. 16, 1892	5	
Navy-yard, New York	Oct. 16, 1892	Jan. 23, 1893	8	
Port Royal, S. C	Jan. 26, 1893	Mar. 9, 1893	681	
New York yard	Mar. 12, 1893	Mar. 30, 1893	681	
Hampton Roads, Va	Mar. 31, 1893	Apr. 24, 1893	276	Took part in naval rendezvous and review.
Narrows, New York	Apr. 25, 1893	Apr. 26, 1893	268	
New York (off Eighty-ninth street).	Apr. 26, 1893	May 31, 1893	27	
Navy-yard, New York	May 31, 1893	June 20, 1893	8	Assigned to Pacific station.
Monterey, Capt. LOUIS KEMPFF, U. S. Navy, commanding.				
Mare Island yard	....	May 27, 1893	....	Pacific station.
Do	June 4, 1893	June 24, 1893	....	Placed in commission Feb. 13, 1893.
Seattle, Wash	June 30, 1893	July 5, 1893	....	On trial trip.
Tacoma, Wash	July 5, 1893	July 8, 1893	....	
Astoria, Oregon	July 8, 1893	July 13, 1893	....	
Portland, Oregon	July 15, 1893	July 27, 1893	....	
Willipa Bay	July 29, 1893	Aug. 1, 1893	....	
San Francisco, Cal	Aug. 5, 1893	Aug. 15, 1893	....	
Mare Island	Aug. 15, 1893	....	....	Receiving her turrets.
Newark, Capt. SILAS CASEY, U. S. Navy, commanding. Relieved by Capt. SILAS W. TERRY, U. S. Navy, May 16, 1893.				
Genoa, Italy	Oct. 28, 1892	Nov. 8, 1892	873	Flagship South Atlantic station.
Spezia, Italy	Nov. 8, 1892	Dec. 1, 1892	45	
Naples, Italy	Dec. 2, 1892	Dec. 7, 1892	390	
Messina, Sicily	Dec. 8, 1892	Dec. 10, 1892	182	
Corfu, Ionian Islands	Dec. 11, 1892	Dec. 16, 1892	289	
Brindisi, Italy	Dec. 17, 1892	Dec. 19, 1892	110	
Smyrna, Turkey in Asia	Dec. 21, 1892	Dec. 30, 1892	660	
Latitude 36° 19′ N., longitude 20° 27′ E.	Dec. 31, 1892	Jan. 1, 1893	399	
Cadiz, Spain	Jan. 7, 1893	Jan. 20, 1893	1,600.8	
Gibraltar	Jan. 20, 1893	....do	75	
Naples, Italy	Jan. 24, 1893	Jan. 31, 1893	1,028.8	
Marseilles, France	Feb. 3, 1893	Feb. 8, 1893	543	
Cadiz, Spain	Feb. 11, 1893	Feb. 18, 1893	843.8	Towing caraval Nina.
Las Palmas, Canaries	Feb. 22, 1893	Feb. 25, 1893	716.6	
St. Thomas, Danish West Indies	Mar. 12, 1893	Mar. 14, 1893	2,900	
Havana, Cuba	Mar. 21, 1893	Mar. 23, 1863	1,253	Transferred Mar. 1, 1893 to naval review fleet.
Hampton Roads, Va	Mar. 26, 1893	Mar. 27, 1893	980	
Norfolk, Va	Mar. 27, 1893	Apr. 8, 1893	12	
Hampton Roads, Va	Apr. 8, 1893	Apr. 24, 1893	257.9	Took part in naval rendezvous and review.
New York, Lower Bay	Apr. 25, 1893	Apr. 26, 1893	13	
New York, North River	Apr. 26, 1893	June 6, 1893	1,021.7	
Gaspé Basin, Quebec	June 11, 1893	June 13, 1893	350	Towing caravals.
Quebec, Quebec	June 15, 1893	June 17, 1893	1,533.4	
Norfolk, Va	June 22, 1893	Sept. 20, 1893	287	Ordered to proceed to Rio Janeiro to protect American interests.
Tompkinsville, Staten Island	Sept. 21, 1893	Sept. 25, 1893	....	Taking ammunition.

SECOND RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
San Francisco, Capt. J. C. WATSON, U. S. Navy, commanding.			*Knots.*	
Acapulco, Mexico	Oct. 21, 1892	Oct. 24, 1892	642	Attached to squadron for special service.
San José de Guatemala	Oct. 27, 1892	Nov. 5, 1892	588	
Panama, United States of Colombia.	Nov. 9, 1892	Nov. 19, 1892	904	
Callao, Peru	Nov. 26, 1892	Dec. 11, 1892	1,385	
Valparaiso, Chile	Dec. 16, 1892	Dec. 26, 1892	1,306	
Puntas Arenas	Jan. 1, 1893	Jan. 3, 1893	....	
Montevideo, Uruguay	Jan. 9, 1893	Jan. 23, 1893	1,317	
Bridgetown, Barbados	Feb. 12, 1893	Feb. 12, 1893	4,160	
Port Castries, Santa Lucia	Feb. 13, 1893	Feb. 15, 1893	125	
St. Thomas, Danish West Indies	Feb. 17, 1893	Feb. 18, 1893	263	
Hampton Roads, Va	Feb. 24, 1893	Feb. 20, 1893	1,291	Transferred Mar., 1893, to naval review fleet.
Norfolk, Va	Feb. 26, 1893	Apr. 1, 1893	13	
Hampton Roads, Va	Apr. 1, 1893	Apr. 4, 1893	30	
Lynn Haven Bay, Va	Apr. 4, 1893	Apr. 6, 1893	....	
Hampton Roads, Va	Apr. 6, 1893	Apr. 11, 1893	....	
Lynn Haven Bay, Va	Apr. 11, 1893	Apr. 14, 1893	....	
Hampton Roads, Va	Apr. 14, 1893	Apr. 24, 1893	....	Took part in naval rendezvous and review.
New York Bay	Apr. 25, 1893	Apr. 26, 1893	220	
North River, N. Y	Apr. 26, 1893	May 3, 1893	....	
Navy-yard, Brooklyn, N. Y	May 3, 1893	June 26, 1893	....	
Boston, Mass	June 28, 1893	July 5, 1893	395	Became flagship of the North Atlantic station on May 31, 1893.
Block Island Sound	July 6, 1893	July 7, 1893	257	
Gardiners Bay	July 7, 1893	July 14, 1893	10	
Boston, Mass	July 15, 1893	July 18, 1893	267	
Do	July 22, 1893	Aug. 1, 1893	333	
Gardiners Bay	Aug. 2, 1893	Aug. 13, 1893	267	
North River, N. Y	Aug. 13, 1893	Aug. 15, 1893	100	
Newcastle, Del	Aug. 18, 1893	Aug. 18, 1893	200	
North River, N. Y	Aug. 19, 1893	Aug. 26, 1893	160	
Newport, R. I	Aug. 27, 1893	Sept. 13, 1893	170	
North River, N. Y	Sept. 14, 1893	Sept. 20, 1893	140	
New York navy-yard	Sept. 20, 1893	Sept. 26, 1893	6	
North River, N. Y	Sept. 26, 1893	....	6	
Charleston, Capt. H. F. PICKING, U. S. Navy, commanding.				
San Diego, Cal	Sept. 27, 1892	Oct. 3, 1892	....	North Atlantic squadron for special service.
Off Coronado, Cal	Oct. 3, 1892	Oct. 4, 1892	10	At San Diego last report.
San Diego, Cal	Oct. 4, 1892	Oct. 7, 1892	10	
Redondo Beach, Cal	Oct. 7, 1892	Oct. 10, 1892	100	
Mazatlan, Mexico	Oct. 15, 1892	Oct. 18, 1892	1,039	
Acapulco, Mexico	Oct. 21, 1892	Oct. 21, 1892	623	
San José de Guatemala	Oct. 27, 1892	Nov. 5, 1892	562	
Off Cape Tyre, United States of Colombia.	Nov. 9, 1892	Nov. 10, 1892	885	
Panama, United States of Colombia.	Nov. 10, 1892	Nov. 19, 1892	30	
Callao, Peru	Nov. 26, 1892	Dec. 11, 1892	1,397	
Valparaiso, Chile	Dec. 16, 1892	Dec. 26, 1892	1,303	
Off Cape Pillar, Chile	Dec. 31, 1892	Dec. 31, 1892	1,215	
Sandy Point, Chile	Jan. 1, 1893	Jan. 3, 1893	1,463.5	
Montevideo, Uruguay	Jan. 9, 1893	Jan. 23, 1893	1,355	
Bridgetown, Barbados	Feb. 12, 1893	Feb. 15, 1893	3,921.6	
Charlotte Auralia, St. Thomas	Feb. 17, 1893	Feb. 17, 1893	415.1	
Hampton Roads, Va	Feb. 23, 1893	Feb. 26, 1893	1,300	Took part in naval rendezvous review.
Norfolk, Va	Feb. 26, 1893	Mar. 24, 1893	14	
Hampton Roads, Va	Mar. 24, 1893	Mar. 30, 1893	14	
Do	Mar. 30, 1893	Apr. 5, 1893	30	
Lynn Haven Bay	Apr. 5, 1893	Apr. 6, 1893	18	
Hampton Roads, Va	Apr. 6, 1893	Apr. 11, 1893	18	
Chesapeake Bay	Apr. 11, 1893	Apr. 13, 1893	40	
Hampton Roads, Va	Apr. 13, 1893	Apr. 24, 1893	40	
New York	Apr. 25, 1893	May 3, 1893	226.6	For repairs.
Norfolk, Va	May 4, 1893	....	219.5	Assigned to Pacific squadron.
Miantonomoh, Capt. MONTGOMERY SICARD, U. S. Navy, commanding.				
New York	Oct. 20, 1892	Apr. 25, 1893	27	North Atlantic squadron.
Navesink, N. J	Apr. 25, 1893	Apr. 25, 1893	27	At New York last report; took part in naval review.

SECOND RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
New York	Apr. 25, 1893	June 16, 1893	20	
City Island, Long Island	June 17, 1893	June 17, 1893	20	To receive and escort Viking ship to Chicago; Massachusetts naval militia on board.
New York	do	July 13, 1893		
Boston, Mass	July 15, 1893	Aug. 1, 1893	262	
Gardiner Bay	Aug. 2, 1893	Aug. 10, 1893	109	
Newport	Aug. 10, 1893	Aug. 14, 1893	58	
Bristol	Aug. 14, 1893	Aug. 25, 1893	12	
Newport	Aug. 25, 1893	Sept. 12, 1893	12	Rhode Island naval militia on board.
Gardiner Bay	Sept. 12, 1893	Sept. 19, 1893	55	
Hampstead Bay	Sept. 19, 1893	Sept. 20, 1893	98	
New York	Sept. 20, 1893		31	
Lancaster, Capt. A. H. McCormick, U. S. Navy, commanding				
Nagasaki, Japan	June 12, 1892	Oct. 3, 1892		
Woosung, China	Oct. 6, 1892	Nov. 5, 1892	455	Flagship Asiatic station.
Shanghai, China	Nov. 5, 1892		25	
Woosung, China	Jan. 19, 1893	Jan. 31, 1893	12	
Pagoda Anchorage, Foochow	Feb. 2, 1893	Feb. 6, 1893	454	
Hongkong	Feb. 8, 1893	Feb. 27, 1893	486	
Tylam Bay, Hongkong	Feb. 27, 1893	Mar. 7, 1893	20	
Hongkong	Mar. 8, 1893	Apr. 5, 1893	1,029	
Nagasaki, Japan	Apr. 13, 1893	Apr. 19, 1893	397	
Kobe	Apr. 22, 1893	May 1, 1893	351	
Yokohama	May 3, 1893	June 28, 1893	156	
Owari Bay, Japan	June 29, 1893	June 29, 1893	156	
Yokohama	June 30, 1893			
Atlanta, Capt. F. J. Higginson, U. S. Navy; relieved by Capt. J. R. Bartlett U. S. Navy, May 28, 1893.				
New York	Oct. 20, 1892	Dec. 1, 1892	40	North Atlantic Squadron.
Norfolk, Va	Dec. 2, 1892	Dec. 26, 1892	305	
Port au Prince, Haiti	Jan. 1, 1893	Jan. 2, 1893	1,251	To protect American interests.
Port Antonio, Jamaica	Jan. 3, 1893	Jan. 5, 1893	274	
Port au Prince	Jan. 6, 1893	Jan. 7, 1893	243	
San Domingo City, San Domingo	Jan. 10, 1893	Jan. 15, 1893	440	
Port au Prince	Jan. 17, 1893	Jan. 24, 1893	457	
San Domingo City	Jan. 26, 1893	Jan. 27, 1893	443	
St. Thomas, Dutch West Indies	Jan. 29, 1893	Feb. 1, 1893	301	
San Domingo City	Feb. 2, 1893	Feb. 4, 1893	307	
Port au Prince, Haiti	Feb. 6, 1893	Feb. 10, 1893	442	
Havana, Cuba	Feb. 13, 1893	Feb. 19, 1893	678	
Key West, Fla	Feb. 20, 1893	Mar. 10, 1893	96	
Hampton Roads, Va	Mar. 14, 1893	Mar. 18, 1893	847	
Norfolk, Va	Mar. 18, 1893	Mar. 27, 1893	12	
Hampton Roads, Va	Mar. 27, 1893	Apr. 24, 1893	12	Took part in naval rendezvous and review.
Lower Bay, N. Y	Apr. 25, 1893	Apr. 26, 1893	284	
North River, N. Y	Apr. 26, 1893	May 12, 1893	12	
Kingstown, Jamaica	May 20, 1893	May 21, 1893	1,484	
Greytown, Nicaragua	May 24, 1893	June 13, 1893	626	To protect American interests.
Port Limon, Costa Rica	June 13, 1893	June 13, 1893	67	
Colon, Colombia	June 14, 1893	June 17, 1893	188	
Greytown, Nicaragua	June 19, 1893	June 26, 1893	251	To protect American interests.
Norfolk, Va			882	Put out of commission July 18, 1893.
Boston, Capt. G. C. Wiltse U. S. Navy, commanding; relieved by Capt. B. F. Day, U. S. Navy, Feb. 28, 1893.				
Honolulu, Hawaiian Islands	Aug. 24, 1892	Sept. 29, 1892	2,122	Pacific Squadron.
Hilo, Hawaiian Islands	Sept. 30, 1892	Oct. 1, 1892	235	To protect American interests.
Honolulu, Hawaiian Islands	Oct. 3, 1892	Jan. 4, 1893	410	
Hilo, Hawaiian Islands	Jan. 5, 1893	Jan. 12, 1893	200	
Lahaina	Jan. 13, 1893	Jan. 14, 1893	136	
Honolulu, Hawaiian Islands	Jan. 14, 1893	May 29, 1893	110.4	
Lahaina Roads, Hawaiian Islands	May 30, 1893	June 1, 1893	75	
Honolulu Roads	June 1, 1893	June 2, 1893	73	
Lahaina Roads	June 2, 1893	June 7, 1893	73	
Honolulu	June 7, 1893		75	

THIRD RATE.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
Detroit, Commander W. H. BROWNSON, U. S. Navy, commanding.			*Knots.*	
Norfolk, Va	Sept. 1, 1893	Sept. 13, 1893	....	Placed in commission July 20, 1893.
Hampton Roads	Sept. 13, 1893	Sept. 14, 1893	....	Orders to North Atlantic Station revoked, and ordered to proceed to Rio Janeiro and report for duty in South Atlantic Squadron on Sept. 11, 1893.
Do	Sept. 14, 1893	Sept. 30, 1893	....	Ordered to return for trial trip.
Norfolk	Oct. 1, 1893	Oct. 5, 1893	....	Proceeded to Rio Janeiro.
Marion, Commander C. V. GRIDLEY, U. S. Navy, commanding.				
Yokohama, Japan	Aug. 18, 1892	Sept. 6, 1892	110	Asiatic Station.
Hakodate, Japan	Sept. 9, 1892	Sept. 15, 1892	432	Cruising to protect American interests.
Vladivostok, Siberia	Sept. 18, 1892	Oct. 1, 1892	463	
Chemulpo, Corea	Oct. 9, 1892	Oct. 19, 1892	142	
Chefoo, China	Oct. 20, 1892	Oct. 29, 1892	243	
Woosung, China	Nov. 1, 1892	Nov. 6, 1892	18	
Shanghai, China	Nov. 6, 1892	Dec. 4, 1892	18	
Nagasaki, Japan	Dec. 6, 1892	Dec. 12, 1892	356	
Woosung, China	Dec. 15, 1892	Dec. 19, 1892	382	
Foochow, China	Dec. 22, 1892	Dec. 29, 1892	460	
Amoy, China	Dec. 31, 1892	Jan. 6, 1893	292	
Hongkong, China	Jan. 8, 1893	Jan. 23, 1893	923	
Saigon, Cochin China	Jan. 28, 1893	Feb. 6, 1893	627	
Bangkok, Siam	Feb. 10, 1893	Feb. 20, 1893	37	
Koh Kram Island, Siam	Feb. 20, 1893	Feb. 24, 1893	762	
Singapore, Straits Settlements	Feb. 28, 1893	Mar. 8, 1893	125	
Malacca, Straits Settlements	Mar. 9, 1893	Mar. 13, 1893	276	
Penang, Straits Settlements	Mar. 15, 1893	Mar. 19, 1893	398	
Singapore, Straits Settlements	Mar. 21, 1893	Mar. 25, 1893	288	
Batavia, Java	Mar. 27, 1893	Apr. 4, 1893	559	
Sarawak, Borneo	Apr. 7, 1893	Apr. 11, 1893	382	
Lahuan, Borneo	Apr. 13, 1893	Apr. 17, 1893	582	
Iloilo, Panay Island	Apr. 20, 1893	Apr. 25, 1893	348	
Manila, Luzon Island	May 4, 1893	May 4, 1893	637	
Hongkong, China	May 7, 1893	May 13, 1893	464	
Tung Yung Island, China	May 16, 1893	May 19, 1893	580	
Shanghai, China	May 22, 1893	May 28, 1893	156	
Chinkiang, China	May 30, 1893	June 2, 1893	95	
Wuhu, China	June 3, 1893	June 6, 1893	193	
Kingiang, China	June 7, 1893	June 10, 1893	110	
Hankow, China	June 11, 1893	....	....	
Mohican, Commander H. L. JOHNSON, U. S. Navy, commanding; relieved by Commander NICOLL LUDLOW, U. S. Navy, Jan. 12, 1893.				
Sitka, Alaska	Sept. 24, 1892	Oct. 6, 1892	....	Pacific Station.
Port Townsend, Wash	Oct. 11, 1892	Oct. 12, 1892	856.4	
Seattle, Wash	Oct. 12, 1892	Oct. 15, 1892	40.4	
San Francisco, Cal	Oct. 19, 1892	Oct. 19, 1892	831.1	
San Pablo Bay	....do	Oct. 20, 1892	23.5	
Mare Island, Cal	Oct. 20, 1892	Jan. 29, 1893	4.5	
Honolulu, Hawaiian Islands	Feb. 10, 1893	May 1, 1893	2,479.1	
Port Townsend, Wash	May 17, 1893	May 30, 1893	2,529.4	
Sitka, Alaska	June 4, 1893	June 19, 1893	787.6	Temporary duty with Bering Sea Fleet.
St. Paul, Kadiak Island	June 23, 1893	June 23, 1893	540.4	
Humboldt Harbor, Popoff Island	June 25, 1893	June 28, 1893	385.9	
Bennington, Commander R. B. BRADFORD, U. S. Navy, commanding.				
Cadiz, Spain	Oct. 14, 1892	Dec. 5, 1892	85	South Atlantic Station.
Gibraltar, Spain	Dec. 5, 1892	Dec. 15, 1892	87	
Cadiz, Spain	Dec. 15, 1892	Dec. 20, 1892	25	
Mouth of Guadalquiver, Spain	Dec. 20, 1892	....do	25	For great gun target practice.
Cadiz, Spain	....do	Jan. 17, 1893	....	
Carraca, Spain	Jan. 17, 1893	Jan. 22, 1893	....	
Cadiz, Spain	Jan. 22, 1893	Jan. 31, 1893	90	Towing caravel Pinta to Havana.

THIRD RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
Gibraltar	Jan. 31, 1893	Feb. 5, 1893	90	
Cadiz, Spain	Feb. 5, 1893	Feb. 18, 1893	654	
Las Palmas, Canary Islands	Feb. 22, 1893	Feb. 25, 1893	2,722	
St. Thomas, Dutch West Indies	Mar. 12, 1893	Mar. 14, 1893	1,144	
Havana, Cuba	Mar. 21, 1893	Mar. 23, 1893	807	
Hampton Roads, Va	Mar. 26, 1893	Mar. 27, 1893	....	Took part in naval rendezvous and review.
Norfolk Navy-yard	ar. 27, 1893	Apr. 11, 1893	140	
Hampton Roads, Va	Apr. 14, 1893	Apr. 24, 1893	211	
New York	Apr. 25, 1893	May 5, 1893	62	
Tarpaulin Cove, Mass	May 5, 1893	May 6, 1893	146	Trial of the New York.
Boston, Mass	May 6, 1893	May 11, 1893	24	
Gloucester, Mass	May 11, 1893	May 21, 1893	25	To fit out for foreign station.
Off Isles of Shoals, N. H	May 21, 1893	May 22, 1893	25	
Gloucester, Mass	May 22, 1893	May 23, 1893	....	
Vineyard Haven, Mass	May 23, 1893	May 24, 1893	297	
Whitestone, Long Island	May 24, 1893	May 25, 1893	....	
New York yard	May 25, 1893	....	....	Assigned to European Station.
Concord, Commander Edwin White, U. S. Navy, commanding. Relieved by Commander C. F. Goodrich, U. S. Navy, June 20, 1893.	....	....	....	North Atlantic squadron.
Colon, Colombia	Oct. 5, 1892	Nov. 7, 1892	239.6	At Colon last report.
Key West, Fla	Nov. 12, 1892	Dec. 1, 1892	1,163.0	
Norfolk, Va	Dec. 5, 1892	Mar. 30, 1893	917.0	
Hampton Roads, Va	Mar. 30, 1893	Apr. 24, 1893	287.4	Took part in naval rendesvous and review.
New York, lower bay	Apr. 25, 1893	Apr. 26, 1893	22.0	
New York, North River	Apr. 26, 1893	May 3, 1893	15.0	
Tompkinsville, Staten Island	May 3, 1893	May 4, 1893	279.9	For repairs.
Norfolk, Va	May 5, 1893			
Yorktown, Commander R. D. Evans, U. S. Navy, commanding. Relieved by Commander Frank Wildes, U. S. Navy, Oct. 24, 1892.	....	....	....	Pacific squadron.
Unalaska, Alaska	Sept. 9, 1892	Oct. 1, 1892	2,121	On duty in Bering Sea, in connection with the seal-fisheries.
San Francisco, Cal	Oct. 10, 1892	Oct. 11, 1892	28	
Mare Island, Cal	Oct. 11, 1892	Oct. 30, 1892	1,827	Transferred to squadron for special service.
Acapulco, Mexico	Nov. 7, 1892	Nov. 11, 1892	2,150	
Callao, Peru	Nov. 21, 1892	Dec. 11, 1892	1,263	
Valparaiso, Chile	Dec. 16, 1892	Dec. 24, 1892		
Sandy Point, Chile	Jan. 2, 1893	Jan. 3, 1893	1,348	
Montevideo	Jan. 9, 1893	Jan. 16, 1893	120	
Buenos Ayres	Jan. 17, 1893	Jan. 20, 1893		
Montevideo	Jan. 21, 1893	Jan. 23, 1893	3,980	
Bridgetown, Barbadoes	Feb. 12, 1893	Feb. 13, 1893	125	
Port Castries, Santa Lucia	Feb. 14, 1893	Feb. 16, 1893	356	
Charlotte Amelia, St. Thomas	Feb. 18 1893	Feb. 18, 1893	1,111	
Hampton Roads, Va	Feb. 24, 1893	Feb. 26, 1893	270	
New York navy yard	Feb. 27, 1893	Mar. 30, 1893	270	
Hampton Roads, Va	Mch. 31, 1893	Apr. 4, 1893	....	Took part in naval rendezvous and review.
Do	Apr. 6, 1893	Apr. 11, 1893	53	
Do	Apr. 12, 1893	Apr. 24, 1893	161	
New York (lower anchorage)	Apr. 25, 1893	Apr. 26, 1893	270	
New York (North River)	Apr. 26, 1893	May 3, 1893	20	For repairs.
Navy-yard, New York	May 3, 1893			
Kearsarge, Commander A. S. Crowninshield, U. S. Navy, commanding.				
Puerto Cabello, Venezuela	Sept. 30, 1892	Oct. 5, 1892	....	North Atlantic squadron.
La Guayra, Venezuela	Oct. 6, 1892	Nov. 1, 1892	65	At Puerto Cabello last report to protect American interests.
Port of Spain, Trinidad	Nov. 4, 1892	Nov. 5, 1892	335	
Cuidad Bolivar, Venezuela	Nov. 9, 1892	Nov. 12, 1892	470	
Port of Spain	Nov. 15, 1892	Nov. 23, 1892	420	
La Guayra	Nov. 25, 1892	Dec. 31, 1892	355	
Puerto Cabello	Jan. 2, 1893	Jan. 3, 1893	65	

THIRD RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
Curaçao, Dutch West Indies	Jan. 4, 1893	Jan. 6, 1893	110	
Santa Maria, Colombia	Jan. 8, 1893	Jan. 9, 1893	350	
Savanilla, Colombia	Jan. 9, 1893	Jan. 11, 1893	50	
Cartagena, Colombia	Jan. 12, 1893	Jan. 14, 1893	83	
Colon, Colombia	Jan. 17, 1893	Jan. 22, 1893	280	
Greytown, Nicaragua	Jan. 24, 1893	Jan. 27, 1893	240	
Havana, Cuba	Feb. 1, 1893	Feb. 11, 1893	1,000	
Key West, Fla	Feb. 12, 1893	Mar. 4, 1893	90	
Port au Prince, Haiti	Mar. 7, 1893	Mar. 8, 1893	672	
San Domingo, San Domingo	Mar. 11, 1893	Mar. 25, 1893	453	
Kingston, Jamaica	Mar. 28, 1893	Mar. 29, 1893	458	
Port au Prince, Haiti	Mar. 31, 1893	Apr. 1, 1893	304	To protect American interests.
Cape Haitien, Haiti	Apr. 3, 1893	Apr. 7, 1893	204	
Porto Plata, San Domingo	Apr. 9, 1893	Apr. 16, 1893	113	
Cape Hatien, Haiti	Apr. 17, 1893	May 4, 1893	98	
Norfolk, Va	May 10, 1893	May 13, 1893	1,076	
Gloucester, Mass	May 16, 1893	May 24, 1893	369	On duty in connection with trial of New York.
Portsmouth, N. H	May 25, 1893	Aug. 7, 1893	35	For repairs.
Gardiners Bay	Aug. 8, 1893	Aug. 17, 1893	200	
New York	Aug. 18, 1893	Aug. 25, 1893	80	
Norfolk	Aug. 30, 1893	Sept. 5, 1893	450	Towing Nantucket.
Southport, N. C	Sept. 8, 1893	Sept. 14, 1893	320	
New York	Sept. 17, 1893	Sept. 27, 1893	520	Ordered to destroy wreck of schooner.
New York	Sept. 29, 1893		200	
Dolphin, Commander W. H. BROWNSON, U. S. Navy, commanding. Relieved by Lieut. B. H. BUCKINGHAM, U. S. Navy February 28, 1893.				
New York	Sept. 28, 1892	Sept. 29, 1892	290	Special service.
Off Staten Island, N. Y	Sept. 30, 1892		8	At New York last report on special duty.
New York navy-yard	Oct. 1, 1892	Oct. 11, 1892		
Gravesend Bay	Oct. 11, 1892	do	13	
New York (Forty-ninth street)	do	do	18	
New York (Battery)	do	Oct. 12, 1892	8	
New York (Fiftieth street)	Oct. 12, 1892	do	8	
New York (navy-yard)	do	Oct. 15, 1892	8	
New York (Twenty-eighth street)	Oct. 15, 1892	do		
Stapleton, S. I	do	Oct. 16, 1892	10	
New York navy-yard	Oct. 16, 1892	Oct. 27, 1892	8	
Charleston, S. C	Oct. 30, 1892	Nov. 7, 1892	650	Took part in celebration.
New York navy-yard	Nov. 9, 1892	Nov. 12, 1892	650	
Norfolk, Va	Nov. 13, 1892	Dec. 16, 1892	285	Took part in naval rendezvous and review.
Washington, D. C	Dec. 17, 1892	Mar. 1, 1893	• 180	
Norfolk, Va	Mar. 2, 1893	Apr. 14, 1893	184	
Hampton Roads, Va	Apr. 14, 1893	Apr. 19, 1893	11	
Annapolis, Md	Apr. 19, 1893	Apr. 21, 1893	125	
Hampton Roads, Va	Apr. 22, 1893	Apr. 24, 1893		
New York	Apr. 25, 1893		279	
Do	do	June 6, 1893	170	Cruising in vicinity of New York in connection with naval review fleet and entertainment of H. R. H. the Infanta Eulalie.
Latitude 38° 02′; longitude 74° 52′ W.	June 7, 1893	June 7, 1893	176	To destroy wreck of schooner.
New York	June 8, 1893	July 11, 1893	176	
Washington	July 13, 1893	July 17, 1893	400	
New London, Conn	July 19, 1893	July 20, 1893	500	
Newport	July 20, 1893	July 21, 1893	45	
Boston	July 22, 1893	July 24, 1893	135	
Magnolia, Mass	July 24, 1893	July 25, 1893	25	
Portsmouth, N. H	July 25, 1893	July 26, 1893	37	
Isle of Shoals	July 26, 1893	July 27, 1893	14	
Sorrento, Me	July 28, 1893	July 28, 1893	150	
Bar Harbor	do	July 31, 1893	4	
Bath	Aug. 1, 1893	Aug. 2, 1893	110	
Washington	Aug. 4, 1893	Aug. 26, 1893	720	
New London	Aug. 29, 1893	Sept. 5, 1893	454	
New York	Sept. 5, 1893	Sept. 9, 1893	103	
New London	Sept. 9, 1893	Sept. 15, 1893	103	On duty in connection with trial of Castine.
Long Island Sound, trial course	Sept. 15, 1893	do	22	
New London	do	Sept. 25, 1893	22	
Gardiners Bay	Sept. 25, 1893	Sept. 27, 1893	13	Engaged in target practice.
New London	Sept. 27, 1893		13	

THIRD RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
U. S. S. Adams, Commander THOMAS NELSON, U. S. Navy, commanding.			*Knots.*	
Unalaska, Alaska	July 10, 1892	July 19, 1892	195	Pacific squadron.
St. George Island	July 20, 1892	July 21, 1892	848	At Unalaska last report.
Do	July 27, 1892	July 28, 1892	326	Cruising in Bering Sea in connection with seal fisheries.
Unalaska	July 31, 1892	Aug. 6, 1892	225	
Issamahk Strait	Aug. 8, 1892	Aug. 9, 1892	248	
St. Paul Island	Aug. 11, 1892	Aug. 12, 1892	524	
Do	Aug. 15, 1892	Aug. 16, 1892	106	
St. George Island	Aug. 17, 1892	Aug. 17, 1892	212	
Unalaska	Aug. 18, 1892	Aug. 21, 1892	140	
Issamahk Strait	Aug. 22, 1892	Aug. 23, 1892	143	
Unalaska	Aug. 24, 1892	Sept. 9 1892	427	
St. Paul Island	Sept. 11, 1892	Sept. 11, 1892	299	
Unalaska	Sept. 13, 1892	Sept. 23, 1892	247	
St. Paul Island	Sept. 25, 1892	Sept. 26, 1892	29	
St. George Island	Sept. 26, 1892	Sept. 27, 1892	161	
Unalaska	Oct. 2, 1892	Oct. 20, 1892	264	
St. Paul Island	Oct. 22, 1892	Oct. 22, 1892	308	
Unalaska	Oct. 24, 1892	Oct. 31, 1892	39	
Akutan Island	Oct. 31, 1892	Nov. 1, 1892	46	
Unalaska	Nov. 1, 1892	Nov. 7, 1892	49	
Do	Nov. 7, 1892	Nov. 13, 1892	43	
Akutan Island	Nov. 13, 1892	Nov. 22, 1892	45	
Unalaska	Nov. 22, 1892	Nov. 23, 1892	11	
Do	do	do	11	
Do	Nov. 23, 1892	Dec. 1, 1892	2,105	
Mare Island, Cal	Dec. 7, 1892	Apr. 12, 1893		For repairs.
Honolulu, Hawaiian Islands	Apr. 26, 1893	June 26, 1893	2,118	To protect American interests.
Lahaina, Hawaiian Islands	June 27, 1893		88	
Alliance, Lieut. Commander J. C. RICH, U. S. Navy, commanding. Relieved by Commander W. H. WHITING, U. S. Navy, commanding.				
Honolulu	Oct. 12, 1892	Nov. 26, 1892	2,623	Pacific squadron; at Unalaska last report.
Pango Pango, Samoa	Dec. 13, 1892	Dec. 23, 1892	88	
Apia, Samoa	Dec. 24, 1892	Dec. 28, 1892	88	To protect American interests.
Pango Pango	Dec. 29, 1892	Jan. 23, 1893	88	
Apia, Samoa	Jan. 24, 1893	Jan. 25, 1893	88	
Pango Pango Harbor	Jan. 26, 1893	Jan. 30, 1893	88	
Honolulu, Hawaiian Islands	Feb. 16, 1893	Mar. 4, 1893	2,539	
Hilo, Island of Hawaii	Mar. 5, 1893	Mar. 7, 1893	193	
Lahaina, Island of Main, Hawaiian Islands	Mar. 8, 1893	Mar. 8, 1893	129	
Honolulu, Hawaiian Islands	Mar. 9, 1893	Mar. 16, 1893	75	
Mare Island, Cal	Mar. 28, 1893	May 13, 1893	2,150	
Do	May 13, 1893	May 15, 1893	10	
Acapulco, Mexico	May 25, 1893	May 27, 1893	1,930	
Corinto, Nicaragua	June 1, 1893	June 10, 1893	875	
Panama, United States of Colombia	June 13, 1893	June 17, 1893	728	
Callao, Peru	June 24, 1893		1,307	
Essex, Commander W. W. MEADE, U. S. Navy, commanding.				
Buenos Ayres, Argentine Republic.	July 20, 1892	Sept. 12, 1892	120	South Atlantic station. At Buenos Ayres, last report.
Colonia, Uruguay	Sept. 13, 1892	Oct. 7, 1892	24	
Ensenada, Argentine Republic	Oct. 7, 1892	Oct. 18, 1892	25	
Montevideo	Oct. 19, 1892	Dec. 6, 1892	105	
Colonia	Dec. 7, 1892	Dec. 20, 1892	107	
Montevideo	Dec. 20, 1892	Jan. 9, 1893	107	
Maldonado, Uruguay	Jan. 9, 1893	Jan. 10, 1893	60	
Hampton Roads, Va	Feb. 27, 1893	Mar. 8, 1893	6,730	
Norfolk, Va	Mar. 8, 1893		14	Put out of commission June 13, 1893.
Monocacy, Commander F. M. BARBER, U. S. Navy, commanding.				Asiatic station. At Saddle Islands, last report.
Saddle Islands, China	Aug. 26, 1892	Sept. 1, 1892	88	
Woosung, China	Sept. 1, 1892	Sept. 2, 1892	144	

THIRD RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
Chinkiang, China	Sept. 4, 1892	Oct. 6, 1892	142	Cruising to protect American interests.
Woosung, China	Oct. 7, 1892	Oct. 21, 1892	65	
Saddle Islands, China	Oct. 22, 1892	Oct. 24, 1892	65	
Woosung, China	Oct. 24, 1892	Oct. 25, 1892	14	
Shanghai, China	Oct. 26, 1892	Dec. 26, 1892	156	
Chinkiang, China	Dec. 28, 1892	Dec. 31, 1892	45	
Nanking, China	Dec. 31, 1892	Jan. 4, 1893	50	
Wuhu, China	Jan. 4, 1893	Jan. 8, 1893	193	
Kiukiang, China	Jan. 9, 1893	Jan. 13, 1893	140	
Hankow, China	Jan. 14, 1893	Jan. 17, 1893	584	
Shanghai, China	Jan. 22, 1893	Feb. 5, 1893	76	
Saddle Islands, China	Feb. 6, 1893	Feb. 8, 1893	76	
Shanghai, China	Feb. 9, 1893	Apr. 5, 1893	76	
Saddle Islands, China	Apr. 5, 1893	Apr. 6, 1893	76	
Shanghai, China	Apr. 8, 1893	Apr. 12, 1893	76	
Hankow, China	Apr. 18, 1893	Apr. 23, 1893	588	
Ichang, China	Apr. 28, 1893	May 29, 1893	370	
Hankow, China	June 3, 1893		370	
Thetis, Commander G. C. REITER, U. S. Navy, commanding. Relieved by Lieut. Commander C. T. HUTCHINS on May 4, 1893.				Special service. At Mare Island, last report.
Mare Island, Cal	June 20, 1892	Dec. 12, 1892		
San Diego, Cal	Jan. 1, 1892	Jan. 11, 1893		
Surveying on coast of Lower California.				Resumed work of surveying on coast of Lower California.
San Diego	Jan. 31, 1893	Feb. 11, 1893		
Surveying on coast of Lower California.				
Machias, Commander C. J. TRAIN, U. S. Navy, commanding.				
Portsmouth, N. H	July 20, 1893	Aug. 9, 1893		Placed in commission July 20, 1893.
Machias, Me	Aug. 9, 1893	Aug. 14, 1893		
Portsmouth, N. H	Aug. 15, 1893			At navy-yard.
Alert, Commander R. D. HITCHCOCK, U. S. Navy, commanding. Relieved by Commander G. M. BOOK Apr. 1, 1893.				Asiatic station. At Nagasaki, last report.
Nagasaki, Japan	July 9, 1892	Sept. 12, 1892		
Yokohama	Sept. 18, 1892	Nov. 22, 1892	410	
Kobe, Japan	Nov. 27, 1892	Dec. 1, 1892	390	
Nagasaki	Dec. 5, 1892	Dec. 15, 1892	483	
Ningpo, China	Dec. 19, 1892	Jan. 3, 1892	822	
Hongkong, China	Jan. 7, 1893	Jan. 18, 1893	174	
Swatow, China	Jan. 20, 1893	Jan. 31, 1893	174	
Hongkong, China	Feb. 1, 1893	Feb. 11, 1893	83	
Canton, China	Feb. 15, 1893	Feb. 24, 1893	83	
Hongkong, China	Feb. 24, 1893	Mar. 11, 1893	687	
Manila, Philippine Islands	Mar. 18, 1893	Mar. 25, 1893	627	
Hongkong, China	Mar. 29, 1893	Apr. 1, 1893	1,081	
Nagasaki, Japan	Apr. 10, 1893	Apr. 11, 1893	737	
Yokohama, Japan	Apr. 16, 1893	Apr. 17, 1893	1,110	
Chemulpo, Korea	Apr. 24, 1893	Apr. 29, 1893	498	
Shanghai, China	May 2, 1893	May 4, 1893	503	
Chemulpo, Korea	May 6, 1893	May 25, 1893	489	
Shanghai, China	May 28, 1893	June 3, 1893	488	To protect American interests.
Chemulpo, Korea	June 5, ——	July 20, 1893	640	
Kobe, Japan	July 26, 1893	July 26, 1893	386	
Yokohama	July 28, 1893	Aug. 15, 1893	4,819	Ordered home.
San Francisco, Cal	Sept. 21, 1893	Sept. 23, 1893	28	Put out of commission Oct. 7, 1893.
Navy-yard, Mare Island, Cal	Sept. 23, 1893			
Ranger, Commander H. E. NICHOLS, U. S. Navy, commanding. Relieved by Commander EDWIN LONGNECKER, U. S. Navy, Nov. 2, 1892.				Pacific squadron. At Mare Island last report.
Mare Island, Cal	Oct. 15, 1892	Dec. 31, 1892	26	
Port Townsend, Wash	Apr. 18, 1893	May 2, 1893	8,260	Cruising in Bering Sea in connection with seal fisheries.

THIRD RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
Quartermaster Harbor, Wash	May 5, 1893	May 11, 1893	58.4	
Port Townsend, Wash	May 11, 1893	May 15, 1893	57.6	
Seattle, Wash	May 15, 1893	May 20, 1893	40.9	
Port Townsend, Wash	May 20, 1893	May 31, 1893	53.4	
Sitka, Alaska	June 7, 1893	June 10, 1893	1,219.7	
Sand Point, Alaska	June 18, 1893	June 27, 1893	1,391.5	
Dutch Harbor, Alaska	July 1, 1893	July 8, 1893	524.5	
Do	July 24, 1893	July 29, 1893	2,190.5	
Do	Aug. 24, 1893	Aug. 31, 1893	2,963.5	
Do	Sept. 12, 1893	Sept. 21, 1883	1,889	
San Francisco, Cal	Sept. 30, 1893		2,114.5	

FOURTH RATE.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
Vesuvius, Lieut. SEATON SCHROEDER, U.S. Navy, commanding. Relieved by Lieut. Commander FRANK COURTIS, June 15, 1893.				
Navy-yard, New York	Oct. 20, 1892	Oct. 27, 1892	640	North Atlantic squadron.
Charleston, S. C	Oct. 29, 1892	Nov. 6, 1892	619	Took part in celebration Oct. 31 to Nov. 5.
New York	Nov. 8, 1892	Jan. 2, 1893		
Port Royal, S. C	Jan. 5, 1893	Feb. 26, 1893	679	
New York yard	Feb. 28, 1893	Mar. 30, 1893	665	To test and range pneumatic guns.
Hampton Roads, Va	Mar. 31, 1893	Apr. 4, 1893	273	
Do		Apr. 4, 1893	125	
Do	Apr. 6, 1893	Apr. 11, 1893	183	Took part in naval rendezvous and review.
Do	Apr. 13, 1893	Apr. 24, 1893	277	
New York	Apr. 26, 1893	May 16, 1893	268	
Gloucester, Mass	May 18, 1893	May 22, 1893	28	
Do	May 22, 1893	May 23, 1893	26	
Boston, Mass	May 23, 1893	May 31, 1893	56	
Portsmouth, N. H	May 31, 1893	June 18, 1893	380	Docked.
Boston, Mass	June 27, 1893	July 7, 1893	290	
New York	July 8, 1893	Aug. 10, 1893	310	
Gardiners Bay	Aug. 10, 1893	Aug 11, 1893	108	
Newport, R. I	Aug. 11, 1893	Aug. 14, 1893	50	
Gardiners Bay	Aug. 14, 1893	Aug. 17, 1893	50	
Newport, R. I	Aug. 17, 1893	Sept. 10, 1893	50	
New London, Conn	Sept. 10, 1893	Sept. 15, 1893	47	On duty in connection with trial of Castine.
Stratford Shoals	Sept. 15, 1893	Sept. 15, 1893	55	
New London	Sept. 15, 1893	Sept. 17, 1893	55	
New York, North River	Sept. 17, 1893	Sept. 18, 1893	108	
North River to navy-yard	Sept. 18, 1893		7	
Yantic, Lieut. Commander SAMUEL BELDEN, U.S. Navy, Commanding. Relieved by Lieut. Commander HENRY W. LYON, U. S. Navy, May 5, 1893.				
Nueva Palmira, Uruguay	June 30, 1892	July 3, 1892		South Atlantic station.
Paysandu, Uruguay	July 7, 1892	July 21, 1892	110	At Nueva Palmira last report.
Fray Bentos	July 23, 1892	July 27, 1892	57	Cruising in South American waters to protect American interests.
Nueva Palmira, Uruguay	July 27, 1892	Aug. 5, 1892	53	
Martin Garcia, Argentina	Aug. 5, 1892	Aug. 6, 1892	23	
Buenos Ayres Roads, Argentina	Aug. 6, 1892	Aug. 10, 1892	40	
Montevideo, Uruguay	Aug. 11, 1892	Aug. 11, 1892	120	
Buenos Ayres Roads, Argentina	Sept. 9, 1892	Sept. 2, 1892	120	
Colonia, Uruguay	Sept. 23, 1892	Oct. 7, 1892	25	
Buenos Ayres, Argentine Republic.	Oct. 7, 1892	Nov. 7, 1892	35	
Montevideo, Uruguay	Nov. 8, 1892	Dec. 5, 1892	130	
Maldonado, Uruguay	Dec. 7, 1892	Dec. 26, 1892	80	
Montevideo, Uruguay	Dec. 26, 1892	Jan. 5, 1893	70	
Ensenada, Argentine Republic	Jan. 6, 1893	Jan. 6, 1893	110	
Montevideo, Uruguay	Jan. 7, 1893	Feb. 13, 1893	110	
Montevideo, Uruguay	Feb. 14, 1893	Feb. 23, 1893	30	
Maldonado, Uruguay	Feb. 24, 1893	Mch. 29, 1893	68	
Montevideo, Uruguay	Mch. 30, 1893	Apr. 17, 1893	68	

FOURTH RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
English bank, Rio de la Plata...	Apr. 17, 1893	Apr. 17, 1893	15	
Montevideo, Uruguay	....do	May 9, 1893	15	
Buenos Ayres, Argentine Republic.	May 10, 1893	June 20, 1893	130	
Dos Hermanas, Argentine Republic.	June 26, 1893	June 27, 1893	186.3	
Rosario, Argentine Republic	June 28, 1893	....	67.5	
Petrel, Lieut. Commander M. R. S. MACKENZIE, U. S. Navy, commanding. Relieved by Lieut. Commander J. H. DAYTON, U. S. Navy, Feb. 10, 1893.				
Hankow, China	July 1, 1892	Sept. 10, 1892	140	At Hankow last report.
Shanghai, China	Sept. 12, 1892	Sept. 14, 1892	584	
Saddle Islands	Sept. 15, 1892	Sept. 17, 1892	82	
Chinhae, China	Sept. 17, 1892	Sept. 22, 1892	83	
Ningpo, China	Sept. 22, 1892	Sept. 29, 1892	10	
Shanghai, China	Sept. 30, 1892	Oct. 10, 1892	135	
Woosung, China	Oct. 10, 1892	Oct. 26, 1892	12.5	
Shanghai, China	Oct. 26, 1892	Nov. 3, 1892	12.5	
Nagasaki, Japan	Nov. 5, 1892	Nov. 11, 1892	465	
Do	Nov. 11, 1892	....	64	
Yokohama, Japan	Feb. 5, 1893	Mar. 27, 1893	722.7	
Do	Mar. 30, 1893	Apr. 11, 1893	273.5	
Nagasaki, Japan	Apr. 16, 1893	Apr. 16, 1893	750	
Chemulpo, Korea	Apr. 18, 1893	Apr. 25, 1893	451	
Yokohama, Japan	Apr. 29, 1893	May 12, 1893	1,006	
Yokosuka, Japan	May 12, 1893	May 17, 1893	11	
Yokohama, Japan	May 17, 1893	May 23, 1893	11	Temporarily transferred to Bering Sea squadron in connection with seal fisheries.
Dutch Harbor, Unalaska	June 2, 1893	June 9, 1893	2,586	
Korovin Bay, Atka Island	....do	June 12, 1893	450	
Chichagoff, Attu Island	June 19, 1893	June 19, 1893	858	
Dutch Harbor, Unalaska	June 29, 1893	....	1.306	
Bancroft, Lieut. Commander ASA WALKER, commanding. Transferred to Naval Academy, July 27, 1893				
New York yard	Mar. 3, 1893	Apr. 3, 1893	281	Took part in naval rendezvous and review.
Hampton Roads, Va	Apr. 11, 1893	Apr. 24, 1894	299	
New York	Apr. 26, 1893	May 21, 1893	284	
Norfolk, Va	May 22, 1893	May 23, 1893	284	
New York yard	May 24, 1893	....	....	
Michigan, Commander G. E. WINGATE, U. S. Navy, commanding. Relieved by Lieut. Commander R. M. BERRY, March 30, 1892				
Chicago, Ill	Oct. 12, 1892	Oct. 27, 1892	569	At Chicago last report.
Port Huron, Mich	Oct. 30, 1892	Oct. 31, 1892	569	
Detroit, Mich	Oct. 31, 1892	....do	65	
Erie, Pa	Nov. 1, 1892	Nov. 15, 1892	187	
Buffalo, N. Y	Nov. 15, 1892	Apr. 22, 1893	80	
Erie, Pa	Apr. 22, 1893	Apr. 25, 1893	80	
Detroit, Mich	Apr. 26, 1893	Apr. 27, 1893	187	
Chicago, Ill	Apr. 30, 1893	....	634	On duty in connection with World's Columbian Exposition.
Pinta, Lieut. Commander W. MAYNARD, U. S. Navy, commanding. Relieved by Lieut. Commander BURWELL, Feb. 25, 1893.				
Deep Bay, Perit Straits, Alaska.	June 30, 1892	July 2, 1892	....	Cruising in Bering Sea on duty connected with the seal fisheries.
Killisnoo	July 2, 1892	July 7, 1892	42.75	
Fresh Water Bay (Pavloff Harbor)	July 7, 1892	July 8, 1892	32	
William Henry Harbor	July 8, 1892	July 9, 1892	59.50	
Portage Cove (Chilkoot Inlet)	July 9, 1892	July 11, 1892	34	
Pyramid Harbor (Chilcat Inlet)	July 11, 1892	July 17, 1892	20.75	

FOURTH RATE—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
Fresh Water Bay (Pavloff Harbor)	July 17, 1892	July 18, 1892	87.25	
Killisnoo	July 18, 1892	July 21, 1892	32	
Hooniah	July 21, 1892	July 25, 1892	63.50	
Bartletts Bay	July 25, 1892	July 27, 1892	31	
Hooniah	July 27, 1892	July 30, 1892	31	
Basket Bay	July 30, 1892	Aug. 2, 1892	52.50	
Killisnoo	Aug. 2, 1892	Aug. 6, 1892	19	
White Water Bay	Aug. 6, 1892	Aug. 7, 1892	23	
Hamilton Bay	Aug. 7, 1892	Aug. 11, 1892	45	
Cleveland Passage	Aug. 11, 1892	Aug. 13, 1892	36.75	
Taku Harbor	Aug. 13, 1892	Aug. 15, 1892	53.75	
Juneau	Aug. 15, 1892	Aug. 21, 1892	21	
William Henry Harbor	Aug. 21, 1892	Aug. 23, 1892	61	
Portage Cove (Chilkoot Inlet)	Aug. 23, 1892	Aug. 25, 1892	34	
William Henry Harbor	Aug. 25, 1892	Aug. 26, 1892	34	
Hooniah	Aug. 26, 1892	Aug. 30, 1892	56	
Killisnoo	Aug. 30, 1892	Sept. 5, 1892	63.50	
Bartletts Bay	Sept. 6, 1892	Sept. 7, 1892	83	
Muir Glacier	Sept. 7, 1892	do	29	
Deadmans Reach	Sept. 8, 1892	Sept. 8, 1892	121.50	
Shulzes Cove	do	Sept. 9, 1892	14.50	
Sitka	Sept. 9, 1892		26.50	
Sitka	do	Oct. 13, 1892	3	
Sitka, Alaska	Oct. 13, 1892	Jan. 21, 1893		
Shulzes Cove	Jan. 21, 1893	Jan. 22, 1893	28	
McArthur Anchorage Harbor	Jan. 23, 1893	Jan. 24, 1893	140	
Fort Wrangell	Jan. 24, 1893	Jan. 25, 1893	73	
Wards Cove	Jan. 25, 1893	Jan. 26, 1893	85	
Mary Island Anchorage	Jan. 26, 1893	do	25	
Kah-Shak Cove	do	do	8.05	
Steamer Bay	Jan. 27, 1893	Jan. 27, 1893	94	
Fort Wrangell	do	do	115	
Wrangell Narrows	do	Jan. 28, 1893	23	
Sitka	Jan. 29, 1893	May 29, 1893	142	
Deep Bay, Alaska	May 29, 1893	May 30, 1893	30	
Killisnoo, Alaska	May 30, 1893	May 31, 1893	40	
Fresh Water Bay	May 31, 1893	June 4, 1893	30	
Juneau	June 4, 1893	June 12, 1893	78	
Head of Takon Inlet	June 12, 1893	do	28.5	
Taku Harbor	do	June 13, 1893	26.25	
Tracy's Arm of Stephen Passage	June 13, 1893	do	33	
Portage Bay	do	June 14, 1893	64	
Scenery Point in Thomas Bay	June 14, 1893	do	22.5	
Fort Wranfell	do	June 16, 1893	60	
Bradfield Canal	June 16, 1893	do	31	
Tolstoi Bay in Clarence Strait	do	June 17, 1893	49	
Loring	June 17, 1893	do	37	
McDonald Bay	do	do	30	
Rudyerd Bay	do	do	57	
Yankee Point	June 18, 1893	June 18, 1893	151	
Fort Simpson	June 19, 1893	June 19, 1893	84	
Mary Island Custom-House	do	do	45	
Kitchikan Post-office	do	do	22	
Ward's Cove	do	June 22, 1893	6	
Kitchikan Cannery	June 22, 1893	do	6	
New Metlakatlan	do	do	16	
Kitchikan	do	do	16	
Kassaan Village	do	do	27	
Karta Bay	do	June 23, 1893	18	
Shakan	June 23, 1893	June 24, 1893	126.5	
Gut Bay	June 24, 1893	do	80	
White Water Bay	do	June 25, 1893	31	
Killisnoo, Alaska	June 25, 1893	June 27, 1893	16	
Deep Bay	June 27, 1893	do	40	
Sitka, Alaska	do		33	
Albatross, Lieut. Commander Z. L. TANNER, U. S. Navy, commanding.				Temporarily transferred from the U. S. Fish Commission, May 15, 1893, for duty in Bering Sea in connection with the seal fisheries. Returned to San Francisco, Sept. 30, 1893.
Palos, Lieut. Commander J. J. HUNKER, U. S. Navy, commanding.				Condemned and recommended for sale July 6, 1892. Sold at public auction Jan. 25, 1893.

FREIGHT BOAT.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
Fern, Lieut. Commander W. C. GIBSON, U. S. Navy, commanding.			*Knots.*	
Portsmouth, N. H	Sept. 10, 1892	Oct. 18, 1892	....	Engaged in carrying freight between the different navy-yards and stations.
Boston, Mass	Oct. 18, 1892	Oct. 20, 1892	61	
Newport, R. I	Oct. 21, 1892	Oct. 22, 1892	157	
New York	Oct. 23, 1892	Oct. 31, 1892	135	
Philadelphia	Nov. 2, 1892	Nov. 5, 1892	224	
Norfolk, Va	Nov. 6, 1892	Nov. 7, 1892	235	
Baltimore	Nov. 8, 1892	Nov. 8, 1892	163	
Annapolis	....do	Nov. 10, 1892	29	
Washington	Nov. 11, 1892	Nov. 22, 1892	158	
Norfolk	Nov. 23, 1892	Nov. 23, 1892	174	
Philadelphia	Nov. 25, 1892	Dec. 1, 1892	234	
New York	Dec. 2, 1892	Dec. 9, 1892	223	
Philadelphia	Dec. 10, 1892	Dec. 17, 1892	223	
New York	Dec. 19, 1892	Jan. 7, 1893	223	
Newport	Jan. 8, 1893	Jan. 8, 1893	134	
Vineyard Haven	....do	Jan. 9, 1893	45	
Provincetown	Jan. 9, 1893	Jan. 10, 1893	130	
Boston	Jan. 10, 1893	Jan. 12, 1893	50	
Portsmouth	Jan. 12, 1893	Jan. 23, 1893	61	
Boston	Jan. 23, 1893	Jan. 26, 1893	61	
Newport, R. I	Jan. 27, 1893	Jan. 27, 1893	160	
New York	Jan. 28, 1893	Feb. 14, 1893	134	
Norfolk, Va	Feb. 16, 1893	Feb. 26, 1893	290	
Baltimore	Feb. 27, 1893	Feb. 27, 1893	133	
Annapolis	....do	Mar. 1, 1893	28	
Washington, D. C	Mar. 2, 1893	Mar. 10, 1893	131	
Norfolk	Mar. 12, 1893	Mar. 15, 1893	174	
New York	Mar. 17, 1893	Mar. 27, 1893	290	
Norfolk	Mar. 28, 1893	Mar. 31, 1893	290	
New York	Apr. 1, 1893	Apr. 8, 1893	290	
League Island	Apr. 9, 1893	Apr. 14, 1893	224	
New York	Apr. 15, 1893	Apr. 28, 1893	224	
League Island	Apr. 30, 1893	May 2, 1893	224	
Norfolk, Va	May 3, 1893	May 5, 1893	235	
Washington	May 6, 1893	May 12, 1893	175	
Norfolk, Va	May 13, 1893	May 13, 1893	175	
Gloucester, Mass	May 16, 1893	May 20, 1893	515	
Station E on trial course	May 20, 1893	....do	32	
Gloucester, Mass	....do	May 21, 1893	32	
Station E on trial course	May 21, 1893	May 22, 1893	32	
Gloucester, Mass	May 22, 1893	May 23, 1893	32	
Boston, Mass	May 23, 1893	May 24, 1893	26	
Portsmouth, N. H	May 24, 1893	June 5, 1893	61	
Boston, Mass	June 5, 1893	June 6, 1893	61	
Newport	June 7, 1893	June 8, 1893	159	
New London, Conn	June 8, 1893	June 9, 1893	45	
New York	June 10, 1893	June 15, 1893	102	
Norfolk, Va	June 16, 1893	June 17, 1893	289	
Annapolis	June 18, 1893	June 18, 1893	153	
Washington, D. C	June 27, 1893	June 30, 1893	174	
Norfolk	....	....	....	

SAILING SHIPS.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
Monongahela, Commander J. H. SANDS, U. S. Navy, commanding; relieved by Commander T. A. LYONS, U. S. Navy, Nov. 15, 1892.				
Newport, R. I	Oct. 23, 1892	Nov. 20, 1892	632	Apprentice training ship. On practice cruise for instruction of naval apprentices.
Lisbon, Portugal	Dec. 24, 1892	Jan. 11, 1893	3,565	
Funchal, Madeira	Jan. 16, 1893	Jan. 17, 1893	554	
Porto Praya, St. Jago, Cape Verde	Jan. 29, 1893	Feb. 1, 1893	1,628	
Bridgetown, Barbados	Feb. 13, 1893	Feb. 25, 1893	2,080	
Port of Spain, Trinidad	Feb. 26, 1893	Mar. 29, 1893	296	
Fort de France, Martinique, West Indies.	Apr. 6, 1893	Apr. 17, 1893	....	
Charlotte Amalia, West Indies	Apr. 20, 1893	May 1, 1893	331.3	
Gardiners Bay, Long Island	May 15, 1893	May 23, 1893	1,549	
Newport, R. I	May 23, 1893	June 16, 1893	26	
New York	June 17, 1893	....	125	

SAILING SHIPS—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
Constellation, Commander C. F. GOODRICH, U. S. Navy, commanding. Relieved by Commander C. M. CHESTER, U. S. Navy, May 15, 1893.			*Knots.*	
Norfolk, Va	Aug. 30, 1892	Oct. 6, 1892		
Gibraltar	Oct. 29, 1892	Oct. 30, 1892	3, 225	Collecting works of art from European ports to transport same to the United States for World's Columbian Exposition.
Naples	Nov. 8, 1892	Nov. 22, 1892	988	
Gibraltar	Nov. 30, 1892	Dec. 1, 1892	967	
Havre	Dec. 24, 1893	Jan. 11, 1893	1, 950	
Madeira	Jan. 18, 1893	Jan. 19, 1893	1, 372	
Hampton Roads, Va	Feb. 12, 1893	Feb. 13, 1893	3, 831	
New York harbor	Feb. 15, 1893	Mar. 10, 1893	260	
Norfolk, Va	Mar. 12, 1893		270	
Portsmouth, Commander C. D. SIGSBEE, U. S. Navy, commanding. Relieved by Commander C. J. BARCLAY, U. S. Navy, Nov. 15, 1892.				
Newport, R. I	Oct. 7, 1892	Oct. 15, 1892	771	Apprentice training ship.
New York	Oct. 17, 1892	Dec. 31, 1892	150	
Bridgetown, Barbados	Jan. 27, 1893	Feb. 6, 1893	2, 671	Practice cruise for instruction of apprentices.
Fort de France, Martinique	Feb. 7, 1893	Feb. 11, 1893	135	
Port au Spain, Trinidad	Feb. 13, 1893	Mar. 4, 1893	300	
Basseterre, St. Kitts	Mar. 6, 1893	Mar. 17, 1893	445	
Charlotte Amalie, West Indies	Mar. 18, 1893	Apr. 7, 1893	122	
Santa Cruz	Apr. 7, 1893	Apr. 12, 1893	31	
St. Thomas	Apr. 14, 1893	Apr. 18, 1893	31	
Hampton Roads, Va	Apr. 28, 1893	May 13, 1893	1, 307	
Norfolk, Va	May 13, 1893	May 31, 1893	13	
Hampton Roads, Va	May 31, 1893	June 2, 1893	13	
Newport, R. I	June 6, 1893		357	

TORPEDO BOAT.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
Cushing, Lieut. C. McR. WINSLOW, U. S. Navy, commanding. Relieved by Lieut. F. F. FLETCHER, U. S. Navy, Dec. 29, 1892.				
Sag Harbor, N. Y	Oct. 18, 1892	Oct. 10, 1892	49	
New London, Conn	Oct. 19, 1892	Oct. 20, 1892	24	To New London for coal.
Sag Harbor, N. Y	Oct. 20, 1892	Nov. 3, 1892	169	Engaged in torpedo work.
New London, Conn	Nov. 3, 1892	Nov. 4, 1892	56	For repairs to boiler casing.
Sag Harbor, N. Y	Nov. 4, 1892	Nov. 12, 1892	106	Engaged in torpedo work.
New London, Conn	Nov. 12, 1892	Nov. 15, 1892	26	Taking on coal.
Sag Harbor, N. Y	Nov. 15, 1892	Nov. 18, 1892	71	
New London, Conn	Nov. 18, 1892	Dec. 6, 1892	29	
Sag Harbor, N. Y	Dec. 6, 1892	Dec. 14, 1892	146	Working with torpedoes in Peconic Bay.
New London, Conn	Dec. 14, 1892	Dec. 15, 1892	41	For coal.
Sag Harbor, N. Y	Dec. 15, 1892	Dec. 16, 1892	41	
New London, Conn	Dec. 16, 1892	do	41	
Sag Harbor, N. Y	do	Dec. 21, 1892	159	Working with torpedoes in Peconic Bay.
Newport, R. I	Dec. 21, 1892	Mar. 23, 1893		Temporary duty with naval review fleet.
Hampton Roads and Norfolk, between.	Mar. 31, 1893	Apr. 24, 1893	515	Making daily trips between Norfolk and Hampton Roads. Apr. 17 met U. S. S. Blake at Hampton Roads. Apr. 21 met caravels at Hampton Roads.
New York	Apr. 25, 1893	May 6, 1893	391	On temporary duty with naval review fleet.
port, R. I	May 6, 1893	May 9, 1893	137	
tol, R. I	May 9, 1893	do	24	
R. I	do	May 22, 1893		
or and Nayack Bay	May 22, 1893	May 27, 1893	116	
or to Newport	May 27, 1893	May 31, 1893	67	
Tiverton and return	May 31, 1893	do	28	

TORPEDO BOAT—Continued.

Name of vessel and ports visited.	Date of arrival.	Date of departure.	Distance sailed.	Remarks.
			Knots.	
Newport to Sag Harbor	May 31, 1893	June 1, 1893	61	
Nayack Bay and Sag Harbor	June 1, 1893	...do	12	
Nayack Bay to Newport	...do	June 8, 1893	61	
Newport to Sag Harbor	June 8, 1893	June 9, 1893	56	
Sag Harbor and Nayack Bay	June 9, 1893	June 12, 1894	15	
Sag Harbor to New London	June 12, 1893	June 13, 1893	81	
Newport to Nayack Bay and return.	June 13, 1893	June 25, 1893	123	
Newport to Sag Harbor	June 25, 1893	June 26, 1893	56	
Sag Harbor to Shelter Heights	June 26, 1893	...do	24	
Sag Harbor to Newport	...do	June 29, 1893	56	
Newport to Shelter Island Heights.	June 29, 1893	...do	55	
Shelber Island Heights and Nayack Bay.	...do	June 30, 1893	30	
Sag Harbor, etc	July 1, 1893	July 1, 1893	20	
Newport	...do	July 5, 1893	58	
New London	July 5, 1893	July 6, 1893	48	
Sag Harbor, Nayack Bay, and Shelter Island Heights.	July 6, 1893	July 10, 1893	60	
Newport, Coddington Cove, and Tiverton.	July 10, 1893	July 26, 1893	116	
New London	July 26, 1893	July 27, 1893	48	
Sag Harbor and Nayack Bay	July 27, 1893	July 29, 1893	36	
Newport	July 29, 1893	July 31, 1893	56	
New London	July 31, 1893	Aug. 1, 1893	43	
Sag Harbor and Nayack Bay	Aug. 1, 1893	Aug. 6, 1893	57	
Newport	Aug. 6, 1893	Aug. 8, 1893	68	
Sag Harbor	Aug. 8, 1893	...do	56	
Deering Harbor	...do	Aug. 9, 1893	12	
Sag Harbor	Aug. 9, 1893	...do	12	
Newport	...do	Aug. 17, 1893	56	
New London	Aug. 17, 1893	Aug. 18, 1893	48	
Sag Harbor and Nayack Bay	Aug. 18, 1893	Sept. 3, 1893	187	
Newport	Sept. 3, 1893	Sept. 21, 1893	56	
Sag Harbor and firing grounds	Sept. 21, 1893	Sept. 28, 1893	195	
New London	Sept. 28, 1893	Sept. 29, 1893	33	
Newport	Sept. 29, 1893		43	

B.

REPORT OF THE SUPERINTENDENT OF THE NAVAL ACADEMY

U. S. NAVAL ACADEMY,
Annapolis, Md., October 2, 1893.

SIR: (1) I have the honor to submit a report of the operations of the U. S. Naval Academy during the past academic year.

(2) At the annual examination in June, 1893, 38 naval cadets of the line division and 6 of the engineer division completed the four years' course at the Academy and received certificates of proficiency. Of the 38 cadets of the line division who completed the four years' course as above, 3 were honorably discharged,—2 at their own request and 1 on account of physical disqualification for the naval service.

(3) At the same examination 32 naval cadets of the line division and 7 of the engineer division, having completed their six years' service as naval cadets, were examined for final graduation. Thirty-eight of the above passed the professional examination and received certificates of graduation, 3 were found physically disqualified for the naval service, and were honorably discharged; 1 was found deficient and dropped.

(4) The assignments of this class to the several corps of the Navy were as follows:

To the line of the Navy	22
To the Engineer Corps	7
To the Marine Corps	6

(5) At the commencement of the present academic year, October 1, 1893, the numbers in the several classes were:

First class, line division	34
First class, engineer division	13
Second class	49
Third class	54
Fourth class	93
Total	243

(6) The U. S. S. *Bancroft*, assigned by the Department as a naval cadet training and practice vessel, arrived at Annapolis July 21, 1893, and was turned over to the Academy July 28. By direction of the Department she is kept in readiness for sea service, except that perishable stores have been transferred to the navy-yard at Norfolk, Va.

(7) The *Constellation* sailed from the Academy September 25 for Norfolk, Va., where she is now undergoing repairs.

(8) The prescribed course of studies has been followed, but the program of drills and exercises was necessarily modified to meet the [illegible]ected contingency of being, for a time, without a vessel suitable [illegible]anship drills.

[illegible] the want of funds little progress has been made in the [illegible]nt of the new grounds.

(10) The new boiler house, for the building and fitting of which Congress at its last session appropriated $26,000, is in course of construction, and it is believed that it will be ready for use about January 1, 1894.

(11) No satisfactory bids having been received for the erection of two double houses for officers' quarters, it is not expected that they will be ready for occupancy before the beginning of the next academic year.

(12) The rebuilding of the gymnasium has been completed with satisfactory results. There is now ample space on the main floor, and it is fitted with modern appliances of the most approved pattern. In the basement there are three spacious dressing rooms, a large plunge bath, three ordinary bathrooms, a shower and a needle bath, and other conveniences.

(13) In my last annual report it is stated:

> It is urgently recommended that power be given by statute to the Superintendent of the Naval Academy to order courts of inquiry for the investigation of serious offenses committed by navel cadets. It has been found difficult to establish the guilt of those who commit the two gravest offenses—hazing and gouging—and failure to detect and bring to punishment offenders of this class has an injurious effect upon the discipline of the Academy.
>
> It is believed that the cadets who commit these acts are encouraged to do so by the difficulties in the way of detection, which difficulties would be removed if formal sworn testimony could be taken. The enactment of such a statute would in itself so greatly tend to breaking up these practices that the necessity for the exercise by the Superintendent of the power conferred upon him would not be of frequent occurrence.

This recommendation is respectfully renewed.

(14) Appended hereto are a statement of the appropriation for the support of the Naval Academy for the fiscal year ending June 30, 1893, the report of the commanding officer of the practice ship *Constellation*, and a synopsis of the journal of that vessel during the last cruise. [Not published.]

Very respectfully, your obedient servant,

R. L. PHYTHIAN,
Captain, U. S. Navy, Superintendent.

The CHIEF OF THE BUREAU OF NAVIGATION,
Navy Department, Washington, D. C.

Statement of the appropriation of the U. S. Naval Academy for the fiscal year ending June 30, 1893.

Headings of the appropriations.	Amount appropriated.	Expended to June 30, 1893.	Unexpended balance.	Liabilities for articles ordered prior to June 30.	Balance in excess of liabilities.
Pay of professors and others	$52,371.00	$52,349.54	$21.46	....	**$21.46**
Pay of employes, department of steam engineering	7,824.50	7,823.14	1.36	....	**1.36**
Pay of watchmen and others	44,069.95	44,063.39	6.56	....	**6.56**
Heating and lighting, including transfers by order of Superintendent	17,195.03	17,195.03	....	....	....
Contingent and miscellaneous	40,300.00	35,438.37	4,861.63	$4,416.43	**445.20**
Board of Visitors	1,500.00	874.88	625.12	18.00	**607.12**
Special course	5,000.00	1,669.80	3,330.20	1,036.15	**2,294.05**
Repairs	21,000.00	19,542.93	1,457.07	1,427.99	**29.08**
Total	189,260.48	178,957.08	10,303.40	6,898.57	**3,404.83**

O.

REPORT OF THE COMMANDANT OF THE NAVAL TRAINING STATION.

COMMANDANT'S OFFICE,
U. S. NAVAL TRAINING STATION,
Newport, R. I., July 18, 1893.

SIR: During the year ending June 30, 1893, there have been under training at this station 879 apprentices. Of these there were—

At station June 30, 1892	247
Received to July 1, 1893	632
Transferred	445
Discharged	114
Deserted	11
At station June 30, 1893	309

Of those received there were—

Enlisted at station, *Richmond*	21
Enlisted at New York, *Minnesota*	396
Enlisted at Philadelphia, *St. Louis*	70
Enlisted at Washington, *Dale*	81
Enlisted at Erie, *Michigan*	33
Enlisted at Boston, *Wabash*	25
Received from desertion	1
Received by transfer	5

There were transferred from the station to ships—

Jamestown	18
Portsmouth	236
Wabash (hospital)	2
Monongahela	182
Minnesota	6
Philadelphia	1

There have been discharged from the service for—

Inaptitude	78
Physical disability	12
Request of parents or guardians	5
Illegal enlistment	18
Bureau's order	1

There have been—

Desertions	11
Largest number at station on October 15, 1892	394
Smallest number at station on December 24, 1892	147
Average number (daily)	272

The divisional system of training, as described in my report of last year, has been continued; the detail of the work has been thoroughly systematized and its "Routine and Regulations" printed and forwarded to the Bureau. Persistent effort has been made to improve in the manner and matter of instruction, in discipline, and in the general care of the apprentices. Handicapped by an entirely inadequate plant for the work, the success attained has been due to the zeal and intelligence of the officers, under whose direct charge the various parts of the work has been done. Failure to obtain appropriations for suitable buildings for training purposes has forced the consideration and use of every possible means, by repairs and additions to the old buildings, to make them less inadequate for the objects of the station. The second floor of the old gymnasium has been remodeled, and some 1,500 square feet of floor space gained by removing the old bag and hammock racks and building at the west end a bag room, holding 340 bags, flooring over it. The floor space so gained has been partitioned off with strong wire netting and the room used for instruction in seamanship, knotting, splicing, sewing, etc.

The heavy double doors at each end of the building on second floor have been removed and windows substituted, greatly improving the light. At the east end the offices have been placed across the end of the building and floored over, this floor partitioned off with the wire netting and used as a library and schoolroom; it is supplied with electric light for evenings.

A wash and bath house, adjoining the gymnasium on the north, 18 by 100 feet, has been built and fitted with spray pipes and feed-water heater. The floor, sloping to center, is of concrete and a washing trough at end is provided. The piping is connected to supply fresh or salt water, which is warmed in the heater to any desired temperature by steam from the boilers. Here, during the cold season and in rainy weather, at all seasons all the washing and bathing of apprentices required by the "Routine" can be done; a division bathing in an hour. It has proved to be a success in every way. In building No. 10 new floors have been put in basement, kitchen, and mess hall, and in building No. 11 new partitions and chimney have been built, and a kitchen fitted with range and hot and cold water provided.

This has enabled a complete separation of the apprentices' commissary department from all other cooking or messing arrangements, which before, as far as enlisted persons at the station were concerned, were in common.

An additional supply of fresh water has been secured from driven wells with duplication of the pumps and engine.

The station has now an abundant supply of good fresh water, for the first time sufficient for all purposes, including bathing and scrubbing of clothes, and is no longer dependent on a single pump. The reservoir has been recemented and repaired. About 600 yards of macadamized roadway has been built and subsoil drains put in the low ground of the neck near gynasium; also a new sewer from that building to tide water, and that from building No. 10 has been overhauled and in part relaid. A fresh-water tank for rain water from roofs, for use in boilers, with a capacity of 20,000 gallons, has been procured and placed; new division walls and gates, repairs to causeway and sea walls, and buoying the channel completes the list of the improvements of the "plant" during the year.

The general health of the station has been good. There have been no deaths. I append the report of the surgeon, who has continued his quarterly measurements of apprentices, and finds the results of regular hours of work and play, good diet, and the "development drill" to be the same as reported last year.

From tabulated statement, it will be noticed that desertion has fallen from the 30 of last year to 11 this. The requirements in conduct, in orderly habits of dress, and in personal cleanliness, have been greater than those of last year. The petty officers have been better up to their work from further experience in its performance, yet the percentage of apprentices requiring a more severe punishment than demerits has been raised but 2 per centum from 25 per centum of last year.

The average marks of the divisions show an improvement in their drills and exercises, and in seamanship, and in gunnery, etc. The average of the third, the senior division, Ensign H. H. Whittlesey, transferred to the *Portsmouth* June 23, of this year, after filling December 16, 1892, was 3.42, maximum 5, against the average of 2.97 of the division filled December 17, 1891. This gain is general in all the divisions.

In addition to the five illustrated lectures on the "Evolution of the War Ship," mentioned in my report last year, the following have been prepared by the chaplain and read during the year:

I. American History Series.—(1) The story of Columbus; (2) Incidents in early American history; (3) Incidents in our history from 1776 to 1800; (4) The period of the civil war.

II. Naval Incident Series, the War of 1812.—(1) Decatur's daring deeds; (2) The cruise of the *Essex*; (3) The story of the *Constitution;* (4) Perry and MacDonough; (5) Some brisk sloop fights.

III. Physical Geography Series.—(1) Latitude and longitude, zones, seasons, barometer, and thermometer.

These lectures, fifteen in all, illustrated by specially prepared stereoptican slides, have been given at the rate of three a week—from October 1 to June 1—and have proved both interesting and instructive. A daily bulletin of naval news of interest, both home and foreign, culled from the best newspapers and magazines, is published for the use of the apprentices. Other lectures, describing what is to be seen on the foreign stations, giving also their geographical features, both physical and descriptive, are in course of preparation. It is contemplated to have enough of these lectures prepared to have three a week, including such repetition as the matter of the lectures may require to fix it upon the memory of the apprentices. These lectures and bulletins awaken the minds of the apprentices and are very popular with them. The greatest care has been taken in their preparation and that of the slides illustrating them. Much accurate information concerning naval matters and history is given in a form readily assimilated, and the long evenings of the winter season are made pleasant and profitable.

There is little opportunity offered to test comparatively the degree of efficiency reached by the raw boy received here and the boy of the general service of old. Memory brings the latter up as a bright, merry boy, who, at the end of a three years' cruise, could take a message correctly, run aloft like a monkey,and do some simple knotting and splicing in small stuff, pull an oar, and carry powder to his gun. If he knew more, could reef, hand, steer, and throw the lead, he was made an "ordinary seaman" as soon as he was big enough physically.

No boy is here six months without being compelled to learn all the above and very much more. He needs but sixty days at sea, out of sight of land, with the time occupied in handling the sails, battery, and in ship duties, to know more than the boy of old did at the end of a three years' cruise and be ready for the general service. On the training cruises, as at present arranged, a summer cruise from July 1 to October 1, three months, and a winter cruise from January 1 to May 1, four months, with the months of May and November spent at Hampton

Roads, the apprentices acquire the habits of sea and ship life. To acquire the habits of the sea is necessary. The ship life they learn on the station ship here. Any seaman can bear witness to the fact that thorough physical habituation to the sea is acquired in two months of average weather off soundings on a third or fourth rate vessel. That the apprentices really acquire any other useful thing on the training cruises remains to be proved.

The report of the inspection of the *Portsmouth*, a year ago, was made to the Bureau. Apprentices of one cruise were found quite as good in all respects, and better in some, than those who had been on board the vessel two cruises. This year I directed the examination of the best boys of the two senior divisions of the station with the picked boys from the *Monongahela* and from the *Portsmouth*, who competed for the Bailey medal.

I forward herewith the report of the board, giving the mode and subjects of examination, and the marks received by each appentice. The appentice from the *Monongahela* had made two cruises; the one from the *Portsmouth*, one cruise, and the apprentice from the station, none.

I can but repeat the statement of my last report as to the needs of the station. The divisional system has proved itself good, and I recommend that the principle be carried out in full.

I have estimated for divisional buildings therefor, and changed the proposed site of the buildings that any additional room required may be added by building divisional buildings, and for reasons of drainage and convenience.

The larger part of the island up to this time has been given up to use of the commissary department for pasture and mowing fields. I have to recommend that all farming cease; that a foreman laborer, having the qualifications required for that office under Bureau of Yards and Docks, be employed instead of a superintendent of farm, and that the cows be sold and the proceeds invested as capital for a station store that, under the paymaster and with a pay yeoman in charge, will furnish the many small articles required by the apprentices as nearly at cost as possible.

There is much embarrassment in the administration of matters of the station from the fact that officers with families, having no quarters, live some miles away in the city; that all the officers mess on the Richmond, moored a third of a mile away in the harbor, and that on board that vessel are kept all the accounts, clothing, and small stores of the command. I therefore recommend that the station no longer has its personnel attached to the station ship, but that quarters be built or assigned on the island for all of it; that quarters, mess rooms, and kitchen, and the usual wardroom allowance of servants, be provided for unmarried officers; that a storehouse, a mess hall, kitchen, commissary offices, and storerooms be provided.

Estimates have been prepared and forwarded with this object in view.

The use of all buildings on the island for training purposes will largely reduce the expense of the proposed change, which will greatly facilitate the purpose of the station.

There is no longer any doubt that boys or men of suitable age, from 15 to 30 years, of average intelligence and physique can be trained in less than a year to be equal to the average ordinary seaman of the naval service. Boys of 14, now permitted to enlist, are usually too immature in mind and body for training. It is essential, however, to produce the desired result, that the person in training remains at the station six months, is on board the station ship two months, and cruises for three months in special vessels, preferably fitted with auxiliary steam power that they may carry only the men necessary for their safety at sea and make port on date. These vessels during at least sixty days of their cruise to be kept off soundings.

I append tabulated statement, marked A, concerning the drafts of apprentices transferred from the station to the cruising training ships during the year. The success reached at this station has been the result of the hard, persevering work of its officers of all classes. Such work draws heavily upon strength, patience, and tact. It is continuous the year through, and there are no off days, no closing for vacations, no time for the recruitment of energy. I have to ask that three additional commissioned officers, aids to the executive officer, preferably lieutenants of junior grade, be assigned to duty at the station for "officers of the day;" also an ensign as aid to commandant.

Division officers should, to obtain the best results in training their divisions, give their undivided attention to that duty.

The great amount of correspondence necessary to answer the inquiries of parents and guardians concerning their boys (apprentices) and the nature of this correspondence requires an amount of time that the commandant can not personally spare for the mechanical labor involved. Every letter received so far of this character has been answered fully and carefully as a duty. Mothers write, and aid is necessary.

The sections should have a section master to each section of 18 apprentices, 6 to each division. These men should be seamen gunners of the Navy, and while serving here have the ratings, 1 of a chief master at arms, 2 of gunner's mates, first class, 3 of boatswain's mates, first class, for each division. The rating "schoolmaster" should be confined to the instructors in "studies," singing, and bugle playing. The target practice and range and the "new comer's squad" to be in charge of chief master at arms.

I can add nothing to my report of last year to explain the importance of having men of character and skill in these positions. Their duty is continuous, night and day, throughout the year. Apprentices, from their arrival at the station to their transfer from it, ought never to be out of the supervision of trustworthy men.

In the German naval service boys are kept in training nearly three years *for petty officers*. Our own custom is more in accordance with the spirit of our institutions. The petty officers are selected from the apprentices and others by reason of their individual excellence in character and proficiency as shown in service on board ship.

Every effort should be made to enlist for training boys of good character only. The physical requirements, except those of the 14-year-old boys, who should be refused enlistment, are all that is requisite. The training at this station, and the career offered after training to boys, unable for any reason to obtain an education or trade, should make admission here as desirable for that class as admission to the Naval Academy is for boys in more favorable circumstances.

I suggest that this station be made the headquarters of all apprentices, and that a vessel of sufficient capacity, as *Lancaster*, be moored here as their receiving ship; that to her all apprentices be transferred on the completion of their training or cruises in general service and be kept under drill and instruction, those awaiting discharge on majority or who have been three years in the general service receiving a special course. The ship should be particularly fitted for instruction in ordnance, now very imperfectly picked up about the shops at the Washington yard. At the torpedo station, which should be a department of the training station, the apprentices to be given such instruction as is there now given to candidates for the rating of seamen gunner. From this ship all leaves to be granted, all drafts to general service taken, and on attaining majority all discharges made.

Apprentices reënlisting would be better men for the general service, and those not reënlisting would return to their homes better fitted for service to the country in case of war, or for usefulness as citizens in time of peace, than if discharged after a period of idleness from the *Minnesota* or the receiving ships at the navy-yards.

In conclusion, I have to urge the necessity of action. The training system should either be put on a footing its importance to the service and country merits or be abandoned. Last winter for months 300 to 400 boys lived, drilled, slept, and received instruction in one building of two stories, 150 feet by 50 feet. Order, discipline, and cleanliness were maintained. There was no sickness and there was a good deal of recreation.

All the best illustrated papers and magazines and other reading matter were supplied; stereopticon exhibitions, music by the band, and dances were given; games of various kinds were provided, and some invented; but after all was done that could be with the facilities at hand and by the united efforts and ingenuity of the officers much remained to be done. The divisional buildings, etc., for which estimates have been forwarded, will stop the crowding, segregate the mass, improve the discipline, and facilitate the instruction and training.

Very respectfully,

F. M. BUNCE,
Captain, U. S. Navy, Commandant.

The CHIEF BUREAU OF NAVIGATION,
Navy Department.

D.

REPORT OF THE HYDROGRAPHER TO BUREAU OF NAVIGATION.

HYDROGRAPHIC OFFICE, BUREAU OF NAVIGATION,
NAVY DEPARTMENT,
Washington, October 1, 1893.

SIR: I have the honor to submit the following report of the work of this office for the fiscal year ending June 30, 1893.

The office was in charge of Lieut. Commander Richardson Clover, U. S. Navy, Hydrographer, until May 31, on which day he was relieved by Commander Charles D. Sigsbee, U. S. Navy, who then became Hydrographer.

CHART CONSTRUCTION.

With the completion of the Hawaiian cable survey, authorized under the act of March 2, 1891, the results of which were transmitted by the President to Congress in July, 1892, and published by joint resolution of the Houses of Congress as Senate Ex. Doc. No. 153, Fifty-second Congress, first session, and the survey of the Chicago lake front, the results of which were received from the commanding officer of the U. S. S. *Michigan* in October, 1892, and were published in April, 1893, as Hydrographic Office Engraved Chart No. 1365, the recent surveying operations were brought to a close, with the exception of the survey of the west coast of Lower California which, during the winter of 1892 and 1893, was extended by the completion of the main triangulation between Abreojos Point and Pequeña Bay and by the development of a portion of the hydrography within those limits. Preparations have been made under the direction of the commanding officer of the U. S. S. *Thetis* to complete the hydrographic work between Abreojos Point and Pequeña Bay during the next surveying season, and to extend the survey to the southward of Pequeña Bay.

During the year 58 charts were completed and published, 54 of which are engraved on copper and the remainder lithographed or transferred in part from the previously published engraved charts. The general localities covered by these new charts are Canada, Brazil, and China, and the East.

There are now 727 engraved plates available for the printing of nautical charts for the use of the Navy and the mercantile marine. Exclusive of the issue of the Pilot Chart of the North Atlantic Ocean, which has been satisfactorily published by the Division of Chart Construction since September last at the rate of 3,700 copies per month, there have been produced for the use of mariners 41,513 copies of nautical charts, in which the latest available information has been incorporated.

The series of general coast charts of the Western Hemisphere, from Labrador on the east coast and California on the west, to the Strait of Magellan, has been completed with the exception of the chart of the coast of Venezuela, which remains unsurveyed with sufficient accuracy and detail to admit of the construction of a reliable chart. The chart of the Strait of Magellan, from Sandy Point to Cape Pillar, which was withdrawn in 1885 on account of the extensive changes which were rendered necessary by the British, German, and Chilean surveys then and since in progress there, has been reconstructed and again issued.

The recent publication of the charts of the coast of China, from Amoy to Shanghai, and of Japan from Yokohama to Hakodate, provides a series of general coast charts, embracing the waters of China and the East from the Strait of Sunda and the southern passages to the China Sea, to the Island of Yeso or Hokushu at the northern extremity of the Empire of Japan, with the exception of that portion of the coast lying between the mouth of the Yangtze Kiang and the Shantung Promontory, concerning which better data are needed than are at present available.

To gain the fullest benefit in the future from the large outlay that has already been made for the construction and engraving of charts, preparations have been made to electrotype altos of all the important unelectrotyped original chart plates so that there will be the same means at hand for economically reproducing the printing plates after the original ones have been worn out.

A grinding machine for use in manufacturing chart plates, built according to the designs furnished by this office, is about to be installed. A paper-cutting machine has been purchased for use in trimming the charts and giving them a more creditable appearance for issue; and a letter-engraving machine, designed to engrave the figures around the degree rims of the compass roses, has rendered time-saving and efficient service since its completion in February last.

The compilation of a Pilot Chart for the North Pacific Ocean has been commenced, with a view of presenting at convenient intervals, in graphic form, whatever of interest and value to the maritime community of the Pacific coast, is now available for publication, and also of having some means of rendering immediately available for the benefit of mariners such data for extending the knowledge of the physical and meteorological features of the Pacific as may from time to time be collected.

The Pilot Chart of the North Atlantic Ocean has been redrawn and rearranged with the object of increasing its accuracy and effectiveness. It will be published when still further improved.

Notwithstanding the important progress that has been made in constructing nautical charts, foreign charts are still of necessity largely sold in this country for the navigation of merchant vessels, and instances are numerous in which vessels leave our ports supplied with charts that have been condemned abroad. The chart dealer in this country can not well keep a supply of the latest editions of charts made in Europe. He buys his supply of foreign charts and keeps them on his shelves till they are sold, no matter how many new editions have been produced in the meantime by the issuing office. It frequently happens that a needed chart can not be purchased in this country and that the owners must send the vessel to sea without it or else wait till one can be brought from Europe. As a consequence, vessels go to sea constantly without a proper supply of charts. This defect can be partially remedied by making the inspection of the chart outfit of merchant vessels a requirement before granting policies of insurance, but the risk which is incurred through the use of defective charts and of insufficient supplies can not be wholly overcome until the Department has provided itself with a complete set of chart plates from which the maritime community can always be supplied with the most accurate charts at short notice. It is through the medium of cheap and accurate nautical charts that the Department, while providing for the safe navigation of the vessels of the Navy, can most effectively confer a lasting benefit upon the maritime community. The funds at the disposal of this office do not permit of a sufficiently rapid advance to new ground. Each year there is a larger number of original chart plates on hand, and a larger proportion of the force is engaged in keeping them corrected for the issue of charts.

This division has been in charge of Mr. George W. Littlehales, who has conducted the work with great ability.

The following statistical tables set forth in detail the work of the Division of Chart Construction:

Charts engraved on copper and published during the fiscal year ending June 30, 1893.

General locality.	Catalogue No.	Title.	Scale.
			Inches.
Cuba	1337	Jucaro anchorage	M = 1.0
Japan	1338	Esaki Minato	M = 8.0
Japan	1339	Hagi Harbor and approaches	M = 6.0
Japan	1340	Miyatsu Bay and Harbor	M = 6.0
Japan	1341	Susa Minato	M = 8.0
Japan	1342	Tsuruga Bay	M = 1.0
Japan	1343	Uraga Harbor	M = 6.0
Newfoundland	1101	Orange Bay to Cape Bonavista	D. lat. = 15.3
Japan	1344	Kobe and Hiogo Harbors	M = 8.0
Japan	1345	Shimizu Harbor	M = 3.0
Japan	1346	Mera and Koura harbors	M = 6.0
Japan	1347	Tsukumo Harbor	M = 12.0
Japan	1348	Tateyama Bay	M = 2.0
Venezuela	1349	La Guayra	100 yds. = 1.0
China	1361	North Bay, Side Saddle Island	M = 20.0
Brazil	1332	Rio de Janeiro to Santa Catherina Island	D. long. = 4.5
Canada	1350	Cornwall to McKies Point, River St. Lawrence.	M = 2.0
Canada	1351	McKies Point to east entrance to Beauharnois Canal, River St. Lawrence.	M = 2.0
Canada	1352	Eastern entrance to Beauharnois Canal to Montreal, River St. Lawrence.	M = 2.0
Canada	1353	Montreal to Capo St. Michel, River St. Lawrence.	M = 2.0
Canada	1354	Cape St. Michel to Ile St. Ours, River St. Lawrence	M = 2.0
Canada	1355	Ile St. Ours to Ile aux Raisins, River St. Lawrence.	M = 2.0
Canada	1356	Ile aux Raisins to Point du Lac, Lake St. Peter, River St. Lawrence.	M = 2.0
Canada	1357	Point du Lac to Champlain, River St. Lawrence.	M = 2.0
Canada	1358	Champlain to Ste. Emalie, River St. Lawrence	M = 2.0
Canada	1359	Ste. Emilie to Point St. Antoine, River St. Lawrence.	M = 2.0
Canada	1360	Point St. Antoine to Quebec, River St. Lawrence.	M = 2.0
Korea	1362	Approaches to Pingyang Inlet	M = 1.0
Brazil	1364	Approaches to Maranhao	M = 0.5
Japan	1363	Eno Ura	M = 3.0
Illinois, United States	1365	Chicago	M 1.8
Salvador	1366	Acajutla anchorage	M = 2.0
Komandorski Islands	1367	Nikolski anchorage	M 3.0
Pacific Ocean	1368	The Hawaiian Islands	D. long. = 4.5
Brazil	1331	Itacolomi Reef to Rio de Janeiro	D. long. = 4.5
Brazil	1333	Santa Catherina Island to Cape Santa Maria	D. long. = 4.5
Argentine Republic	1369	Santa Cruz River	M 1.0
Japan	1370	Aburatani Bay	M = 2.0
Caribbean Sea	1371	Santa Catherina Harbor, Old Providence Island.	M = 4.0
China	1305	The mouth of the Yangtze Kiang to Formosa Strait.	D. long. = 4.5
Caribbean Sea	1372	Old Providence Island	M = 1.0
Azores	1373	Corvo and Flores Islands	M = 0.5
		Plan of Santa Cruz anchorage	M = 3.0
Caribbean Sea	1374	Serrana Bank	M = 1.0
		Roncador Bank	M = 1.0
		Plan of South Cay Channel	M = 3.0
		Plan of North Cay	100 yds. = 0.5
Brazil	1375	Channel to Para	M = 1.5

Charts engraved on copper and published during the fiscal year ending June 30, 1893—**Cont'd.**

General locality.	Catalogue No.	Title.	Scale.
			Inches.
Bahamas	1377	New Providence Island	M = 2.0
Colombia	1378	Santa Marta Bay	M = 6.0
Yucatan	1379	Mugeres Harbor	M = 1.5
Yucatan	1380	Espiritu Santo and Ascension bays	M = 1.0
		Plan of Cozumel Island	M = 0.25
China and Australia	H	Index to coast, special and harbor charts	D. long. = 0.15
South Pacific Islands	I	Index to coast, special and harbor charts	D. long. = 0.20
Japan	R	Index to coast, special and harbor charts	D. long. = 0.71
Hawaiian Islands	S	Index to coast, special and harbor charts	D. long. = 2.46
Western groups of the North Pacific Islands.	T	Index to coast, special and harbor charts	D. long. = 0.25

Charts lithographed and issued during the fiscal year ending June 30, 1893.

Title.	Scale.	Number of copies.	Remarks.
Pilot chart of the North Atlantic Ocean.	D. long. = 0.27	36,970	Issued monthly since Sept., 1892, in coöperation with the division of marine meteorology.
Transatlantic steamship routes.	D. long. = 0.27	3,900	Supplement to the Pilot Chart for January.
Wreck chart of North Atlantic coast of America.	D. long. = 0.65	3,030	Showing wrecks of sailing vessels since 1887; wrecks of steamers since 1889; the derelicts reported but once, and the drift tracks of derelicts.
Track chart of the United States naval force in Bering Sea, Commander R. D. Evans, U. S. Navy, commanding, 1892.			Showing tracks of the U. S. S. Yorktown, Mohican, Adams, and Ranger and of U. S. R. C. Corwin, Rush, and Bear, and the distances cruised by each vessel in patrolling Bering Sea in 1892.
Western sheet	D. long. = 1.2	700	
Eastern sheet	D. long. = 1.2	700	
Naval chart of the Pacific and Western Atlantic.	D. long. = 0.12	1,350	Showing the territories claimed by England, France, and Germany.
Chart of submarine cables of the world.	D. long. = 0.04	500	Transferred from Hydrographic Office chart plate, No. 1334.
Chart of the naval parade and review in the port of New York.	M = 0.6	3,100	Showing the reserved portions of the port on Apr. 25, 26, and 27, 1893, and giving the names and positions of the vessels taking part.
Chicago	M = 1.8	4,800	Transferred from Hydrographic Office chart plate, No. 1365.
Chart of the world, showing tracks between the principal ports, for full-powered steam vessels, with distances in nautical miles.	D. long. = 0.12	670	There are also tables on the chart giving distances between the important places of China and the East, the west coasts of North and South America, the east coasts of North and South America, and the West Indies. This chart was originally published in June, 1891.

NOTE.—The scale of the chart is expressed in inches by the use of the abbreviations D. long., the length of a degree of longitude on the equator; D. lat., the length of a degree of the meridian in the middle latitude of the chart, and M, the length of a nautical mile. The size of the chart is expressed in inches, measuring between the extreme edges of the border.

SUPPLY AND ISSUE OF CHARTS.

The established methods of maintaining the supply of charts to vessels in commission, to branch offices, and to agents, are found to work smoothly. Errors are very rare and the few that occur are easily traced and quickly rectified.

There are on issue in the Hydrographic Office section, 909 Hydrographic Office charts, an increase of 24 during the year. Fifty-six new charts, of which 5 are index charts, have been received from the division of chart construction. Thirty-two charts have been canceled. Of these 5 are old engraved charts, two are heliogravures, and 25 are photolithographs, There are still on issue 170 photolithographs, 14 of which have been withdrawn from sale in order to maintain a sufficient supply for naval vessels.

As a rule, the production of photolithographic charts, for purposes of navigation, should be avoided, except in cases where the whole edition is to be at once disposed of.

The sale of Hydrographic Office charts during the past year exceeds in value that of any previous year and is 14 per cent in excess of last year's sales. This sale is, of course, much restricted by the fact that, with the exception of general ocean and sailing charts and a few charts of the coasts and harbors of China and Japan, the office publishes only charts of the coasts, harbors, etc., in the western hemisphere.

Within the past sixteen months new catalogues have been prepared for all the stations. Those for the North Atlantic and Pacific stations have been in use for about a year. Those for the European and Asiatic stations, prepared by Lieut. Kimmel, in charge of the British Admiralty section of this division, have only recently been received from the Public Printer, but have been issued to, and used in making up the outfits of, all vessels fitting for those stations since the disbanding of the naval review fleet. That for the South Atlantic station, prepared by Lieut. Robinson, in charge of this division, is now in the hands of the Public Printer.

The present Hydrographic Office catalogue was published two years ago. The edition is nearly exhausted and is filled with corrections, due to the numerous publications and cancellations in that period. Copy for a new edition has been prepared and is about ready for the printer. It is hoped by the incorporation of additional index maps, etc., to make this the most convenient yet issued.

The division of supply and issue has been in charge of Lieut. J. M. Robinson, U. S. Navy.

The following is a statement of the receipts and expenditures of Hydrographic Office and Coast Survey charts for the year:

Statement of charts for the fiscal year ending June 30, 1893.

	Total for the year.	
	Hydrographic Office.	Coast Survey.
Copies of charts received from—		
Division of chart construction	25,001	....
Coast Survey	....	5,727
United States ships	473	28
Total	25,474	5,755
Copies of charts issued to—		
United States ships	5,505	2,578
Agents	9,846	....
Archives	323	188
Office use	552	68
Branch offices	4,457	929
Coast Survey	539	....
Home correspondents	264	....
Foreign hydrographers	270	....
Merchant vessels	46	....
Miscellaneous	2,931	466
Total	24,742	4,229
Charts published	56	....
Copies of charts condemned	1,475	450
Charts canceled	32	....
Plans canceled	2	....
Copies of canceled charts condemned	2,546	....

BRITISH ADMIRALTY SECTION.

The following outfits of charts were issued during the year ;

The *Mohican*, *Monterey*, and *Philadelphia* received complete outfits for the Pacific station. The Pacific outfits of the branch Hydrographic Office at San Francisco, the *Adams*, *Boston*, *Charleston*, and *Yorktown* were completed and rearranged to agree with the new Pacific station catalogue. During the year the Branch Hydrographic office at San Francisco fitted out the *Ranger* and *Alliance* with Pacific outfits; these were replaced by the Division. A Pacific outfit is kept at the branch office in San Francisco, corrected to date and ready for immediate issue.

The *San Francisco* received a complete outfit for the North Atlantic station.

The *Chicago* received a complete outfit for the European station.

The *Concord* received a complete outfit for the Asiatic station.

Special outfits were issued as follows:

The *Constellation* received charts for her Mediterranean cruise and again for the cadets' summer cruise. The *Columbine* received charts for a trip from New York to Portland, Oregon. The *Vesuvius* received charts from Eastport to Montreal, in addition to her former outfit. The *Bennington* received special outfits for the caravels *Pinta* and *Nina*. The Coast Survey steamer *Blake* received charts to take her from Eastport to Chicago. And the *Newark* and *Iwana* received charts from New York to Quebec on accompanying the caravels.

Three complete outfits of all British Admiralty charts on issue by this office, 2,032 charts in each, were issued to the branch Hydrographic offices at Port Townsend, New York, and Chicago, respectively.

Statement of charts issued, received, corrected, etc., in the British Admiralty section for the years ending June 30, 1892, and June 30, 1893.

	1891-'92.	1892-'93.
Charts received, British Admiralty:		
From J. D. Potter (Admiralty agent)	6,528	9,847
From United States vessels (returned outfits)	2,014	1,576
From B. F. Stevens (United States despatch agent):		
Sent to this office	750	20
Sent to United States vessels	506	337
From admiralty office (complimentaries)	217	205
From miscellaneous sources	89	26
Total British Admiralty	10,194	12,011
Hydrographic Office received from Hydrographic Office section	8,019	5,505
Coast Survey received from Hydrographic Office section	3,049	2,578
Coast Survey sent to United States vessels by U. S. Coast and Geodetic survey office	1,413	1,301
Total charts received in this office	22,675	21,395
Charts issued, British Admiralty:		
To United States vessels from this office	4,543	6,220
To United States vessels from B. F. Stevens	596	837
To archives	390	287
To divisions, etc	219	109
To branch Hydrographic Offices Port Townsend, New York, and Chicago		6,067
Total British Admiralty	5,748	13,020
Total Hydrographic Office	8,019	5,505
Total Coast Survey	4,462	3,879
Total charts issued from this office	18,229	22,404

British Admiralty charts on hand July 1, 1892 13
British Admiralty charts received during the year 11,
210
British Admiralty charts issued during the year ....
British Admiralty charts condemned ....

British Admiralty charts on hand June 30, 1893

Corrections made on British Admiralty charts.

	1891-'92.	1892-'93.
From notices to mariners:		
Total standards affected by notices	1,028	923
Total number of charts corrected from notices	3,871	4,213
Total number of charts corrected by British Admiralty and other data	5,133	3,905

There have been 64 new British Admiralty charts received and placed on issue, 12 reissued, 30 canceled, and 10 withdrawn from issue. The total number now issued to United States vessels is 2,046.

SAILING DIRECTIONS.

The compilation of new sailing directions and supplements to old editions, and the revision of old editions, has been steadily proceeded with under the supervision of Lieut. R. G. Davenport, U. S. Navy.

The following publications were placed on issue:

H. O. No. 31. Light List No. 2.
H. O. No. 101. The Methods and Results of the Survey of the West Coast of Lower California.
H. O. No. 98a. Uniformity of Geographic Nomenclature. By D. Marton Ferreiro (translation).
H. O. No. 102. The Azores, Madeiras, Salvages, Canaries, and Cape Verde Islands.
H. O. No. 103. Submarine Cables.
H. O. No. 30. Light List No. 1.
H. O. No. 58. The Navigation of the Pacific Ocean, China Seas, and connecting waters.
H. O. No. 32. Light List No. 3.
H. O. No. 84. West Coast of Mexico and Central America, including Gulfs of California and Panama.
Annual Report of the Hydrographer to the Bureau of Navigation for the fiscal year ending June 30, 1892.

Supplements to the following sailing directions were prepared and placed on issue, as also were sheet corrections for various sailing directions other than those published by this office:

H. O. No. 60. Coast and Ports of the Bay of Biscay.
H. O. No. 18. The West Coast of Africa, Vol. III.
H. O. No. 88. The East Coast of South America.
H. O. No. 64. Caribbean Sea and Gulf of Mexico, Vol. II.
H. O. Catalogue.

Printed and in the hands of the printer being bound:

H. O. No. 104. Anchorages Atlantic and Gulf Coasts of the United States.
H. O. No. 31. The English Channel, Part I. Supplement.

The following were revised, kept corrected to date, and are now ready for the press:

The West Coast of Africa, Vol. I. The West Coast of Africa, Vol. II. The West Coast of Africa, Vol. III. To be printed in one volume.
A new edition, four volumes, Light List of the World.
Supplement to Caribbean Sea and Gulf of Mexico, Part I, H. O. No. [illegible]
Supplement to English Channel, Part II, H. O. No. 35.

Sailing directions in course of preparatio

West Coast of Europe, Brest to Gibraltar.

The following new publications were r

From the United States Coast and Geodetic S
United States Coast Pilot, Atlantic Coast
Tide Tables, Atlantic Coast, 1894.
Notices to Mariners.
Catalogue of Charts, Plans, and Saili
From the United States Light-House Boar
Beacons, Buoys, and Day Marks for
Light List, At[illegible]ast, 1893 and

From the United States Light-House Board—Continued.
    Light List, Pacific Coast, 1892 and 1893.
    Light List, Northern Lakes and Waters.
    Notices to Mariners.
From the United States Treasury Department:
    List of Merchant Vessels, 1892.
From the United States Nautical Almanac Office:
    Ephemeris and Nautical Almanac, 1894.
    Nautical Almanac, 1894.
From British Admiralty (purchased):
    Red Sea and Gulf of Aden, 1892.
    Mediterranean Pilot, Vol. IV, 1892.
    Bay of Bengal Pilot, 1892.
    North Sea Pilot, Part IV, 1892.
    Admiralty Catalogue of Charts and Plans, 1893.
    Tide Tables, British and Irish Ports, 1893.
    Revised Supplement to Danish Pilot, 1892.
    Revised Supplement to Africa Pilot, Vol. III, 1892.
    Supplement to Australia Directory, Vol. II, 1892.
    Supplement to Norway Pilot, Part I, 1893.
    Supplement to Baltic Pilot, 1893.
    Supplement to China Sea Directory, Vol. II, 1893.
    Light List, Western Coast of Europe, 1893.
    Light List, British Islands, 1893.
    Light List, North, Baltic, and White Seas, 1893.
    Light List, Mediterranean Sea, 1893.
From B. F. Stevens, London (sent directly to ships on foreign stations).
    Red Sea and Gulf of Aden Pilot, 1892.
    Bay of Bengal Pilot, 1892.
    Revised supplement to Africa Pilot, Vol. III, 1892.
    Supplement to Australia Directory, Vol. II, 1892.
    Supplement to China Sea Directory, Vol. II, 1893.

The following publications were withdrawn from issue, being canceled by later editions placed on issue during the year:

H. O. No. 30. Light List No. 1.
H. O. No. 31. Light List No. 2.
H. O. No. 32. Light List No. 3.
H. O. Nos. 50, 51, and 53. The Azores, Madeiras, Salvages, Canaries, and Cape Verde Islands.
H. O. No. 84. The West Coast of Mexico and Central America, including Gulf of California.
Supplement to the Coast and Ports of the Bay of Biscay, 2d edition.
Supplement to West Coast of Africa, Vol. III, 1886.
Supplement to East Coast of South America, 1891.
Supplement to Caribbean Sea and Gulf of Mexico, Vol. II, 1890.
Supplement to English Channel, Part I, 1889 and 1891.
United States Coast Pilot, Atlantic Coast, Part IV, 1st edition.
List of Beacons, Buoys, and Stakes, Various Districts, 1891, and 1892 (L. H. B.).
Light List, Atlantic Coast (L. H. B.), 1891 and 1892.
Light List, Pacific Coast (L. H. B.), 1892.
Tide Tables, Atlantic Coast, 1892.
List of Merchant Vessels, 1891.
Tide Tables, British and Irish Ports, 1892.
Light List, Western Coast of Europe, 1892.
Light List, British Islands, 1892.
Light List, North, Baltic, and White Seas, 1892.
Red Sea Pilot and Supplement, 1883.
Gulf of Aden Pilot, 1887.
Bristol Channel, 1884.
Mediterranean Pilot, Vol. IV, 1883.
Bay of Bengal Pilot and Supplement, 1887.
North Sea Pilot, Part IV, and Supplement.
Tide Tables, British and Irish Ports, 1887.
Supplement to Danish Pilot, 1890.
Supplement to Africa Pilot, Part III, 1890.
H. N. No. 3 of 1890.
H. N. No. 7 of 1891.
H. N. No. 11 of 1885.
H. N. No. 9 of 1886.

VESSELS FITTED OUT.

The following vessels were supplied with outfits of sailing directions and nautical books from this division:

Name of ship, etc.	Outfit furnished.	Remarks.
Newark	Special European	In connection with World's Columbian Exposition.
Bennington	do	Do.
Constellation	do	Do.
L. H. T. Columbine	Special Atlantic and Pacific.	For passage to San Francisco.
San Francisco branch office	Pacific Station	Kept in branch office for issue.
Franklin	Special Atlantic	From Hatteras to Portsmouth.
Pinta	Special Atlantic	For crossing Atlantic.
Nina	do	Do.
Chicago branch office	Complete set of books	
Naval Exhibit Chicago	Complete set of H. O. publications.	For exhibit.
Bancroft	North Atlantic Station	Regular outfit for cruising.
Enterprise	North Atlantic and special European	Do.
Monterey	Pacific Station	Do.
Constellation	Special North Atlantic and European.	Practice cruise of the Naval cadets.
Philadelphia	Complete outfit for all stations	For cruising on all stations.
Chicago	do	Do.
Baltimore	Asiatic Station	For cruising.
Stiletto	Special North Atlantic	For special work.
Cushing	do	Do.
Concord	Complete outfit for Asiatic Station	Regular outfit for cruising.

ARCHIVES.

Documents.—During the past year there have been received, indexed, catalogued, and placed in the archives and on the shelves for reference 451 documents, 440 books, and 300 pamphlets.

For the documents we are indebted to the following:

From United States vessels of war:

U. S. S. *Albatross*, Commander Z. L. Tanner, commanding; Lieut. A. F. Fechteler, navigator.

U. S. S. *Alert*, Commander G. R. Durand and Commander R. D. Hitchcock, commanding; Lieut. D. H. Mahan and Lieut. W. H. Allen, navigators.

U. S. S. *Alliance*, Commander W. H. Whiting, commanding; Lieut. R. Henderson, navigator.

U. S. S. *Atlanta*, Capt. F. J. Higginson, commanding; Lieut. J. C. Wilson, navigator.

U. S. S. *Baltimore*, Capt. W. R. Bridgman, commanding; Lieut. G. Blocklinger, navigator.

U. S. S. *Bennington*, Commander R. B. Bradford, commanding; Lieut. C. E. Colahan, navigator.

U. S. S. *Boston*, Capt. G. C. Wiltse and Capt. B. F. Day, commanding; Lieut. E. K. Moore and Lieut. J. W. Coffin, navigators.

U. S. S. *Chicago*, Capt. J. F. McGlensey, commanding.

U. S. S. *Concord*, Commander E. White, commanding; Lieut. F. W. Nichols, navigator.

U. S. S. *Constellation*, Commander C. F. Goodrich, commanding; Lieut. F. W. Nichols, navigator.

U. S. S. *Essex*, Commander W. W. Mead, commanding; Lieut. J. T. Newton, navigator.

U. S. S. *Kearsarge*, Commander A. S. Crowninshield, commanding; Lieut. J. E. Roller, navigator.

U. S. S. *Lancaster*, Capt. A. H. McCormick and Capt. H. B. Seely, commanding; Lieut. E. B. Barry and Lieut. H. H. Barroll, navigators.

U. S. S. *Marion*, Capt. J. R. Bartlett and Capt. C. V. Gridley, commanding; Lieut. J. A. Norris and Lieut. A. McCracken, navigators.

U. S. S. *Michigan*, Commander G. E. Wingate, commanding.

U. S. S. *Mohican*, Commander H. L. Johnson and Commander Nicoll Ludlow, commanding.

From United States vessels of war—Continued.
U. S. S. *Monocacy*, Commander M. L. Johnson and Commander F. M. Barber, commanding; Lieut. C. A. Foster, navigator.
U. S. S. *Monongahela*, Commander T. A. Lyons; Lieut. W. W. Kimball, navigator.
U. S. S. *Newark*, Capt. Silas Casey, commanding.
U. S. S *Petrel*, Lieut. Commander, M. R. S. McKenzie and Lieut. Commander J. F. Dayton, commanding; Lieut. F. H. Lefavor, navigator.
U. S. S. *Portsmouth*, Commander C. D. Sigsbee, commanding; Lieut. A. C. Dillingham, navigator.
U. S. S. *Pinta*, Lieut. Commander W. Maynard, commanding; Lieut. D. Peacock, navigator.
U. S. S. *Ranger*, Commander E. Longnecker, commanding; Lieut. J. B. Collins, navigator.
U. S. S. *San Francisco*, Capt. J. C. Watson, commanding; Lieut. J. F. Moser, navigator.
U. S. S. *Thetis*, Commander G. C. Reiter, commanding; Lieut. W. V. Bronaugh, navigator.
U. S. S. *Yantic*, Lieut. Commander S. Belden, commanding; Lieut. Albert Mertz, navigator.
U. S. S. *Yorktown*, Commander F. Wildes, commanding.
From the various United States consulates:
United States Consul-General Thomas Adamson, Panama, United States of Colombia.
United States Consul-General Oliver H. Dockery, Rio de Janeiro, Brazil.
United States Consul-General Henry W. Severance, Honolulu, Hawaiian Islands.
United States Consul-General Willard D. Tillotson, Kanagawa, Japan.
United States Consul Calisto Alvargowgales, Gijon, Spain.
United States Consul James M. Ayers, Para, Brazil.
United States Consul Edward Bedloe, Amoy, China.
United States Consul H. W. Bowen, Barcelona, Spain.
United States Consul Louis Dexter, Fayal, Azores.
United States Consul Almar F. Dickson, Gaspé Basin, Quebec.
United States Consul William R. Estes, Kingston, Jamaica.
United States Consul Edward A. Dimmick, Barbados, West Indies.
United States Consul Anthony Godbe, Ensenada, Mexico.
United States Consul Charles T. Grellet, Algiers, Algeria.
United States Consul John F. Healy, Funchal, Madeira.
United States Consul G. F. Hollis, Cape Town, Africa.
United States Consul Alfred B. Keevel, Martinique, West Indies.
United States Consul Adam Lieberknecht, Tampico, Mexico.
United States Consul Thomas S. McLain, Nassau, New Providence.
United States Consul Dwight Moore, Aden, Arabia.
United States Consul Modesto Pineiro, Santander, Spain.
United States Consul William G. Riley, Puerto Cabello, Venezuela.
United States Consul Leonard B. Smith, Curaçao, West Indies.
United States Consul Horatio I. Sprague, Gibraltar, Spain.
United States Consul Peter Strickland, Gorée-Dakar, Africa.
United States Consul Albert S. Twitchell, Santiago, Cuba.
United States Consul James Vissea, La Paz, Mexico.
United States Consul John Worthington, Island of Malta.
United States Vice-Consul Samuel Galbraith, Antigua, West Indies.
United States Consular Agent R. H. Gadd, Punta Arenas, Costa Rica.
United States Consular Agent Richard Gibbs, Nuevitas, Cuba.
United States Consular Agent Thomas Miller, Grand Canary.
United States Consular Agent Florentino Sowya, Champerico, Guatemala.
United States Consular Agent Roger R. Vair, San Jose de Guatemala.

Charts.—Many charts have been received, registered, delivered on requisition, and rearranged; 3,051 copies of charts affected by Notices to Mariners have had reference marks made on them; 13 sets of index charts and 23 catalogues have been compared and kept correct to date, and the division has been kept supplied with all the latest charts as fast as they are published

Summary of new and corrected charts received and of old ones condemned by cancellation.

	Received.	Condemned.		Received.	Condemned.
British admiralty	507	473	Portuguese	13	11
Brazilian	2	0	Spanish	21	9
Chilean	47	0	Swedish	26	4
Danish	3	2	Imray & Son	2	0
Dutch	12	5			
Ecuadorean	6	0	U. S. Coast and Geodetic Survey	190	176
French	73	202	U. S. Hydrographic Office	317	0
German	14	0	U. S. Engineers	22	22
Hawaiian	4	0	U. S. Light-House Board	32	0
Italian	5	0			
Japanese	135	106	Total since June, 1892	1.431	1.010

For various reasons and purposes about 7,000 charts were handled during the year. The number of charts issued to United States vessels of war, and therefore subject to correction when affected by Hydrographic Office Notices to Mariners, is as follows:

British admiralty	2,046
Hydrographic Office	900
U. S. Coast and Geodetic Survey	436
Total	3,382

NOTICES TO MARINERS.

During the year 1,086 announcements of importance to navigation were published in the usual form of Notices to Mariners, which were issued promptly on Saturday of each week, and the circulation of which, together with the extracts, amount to 830,061.

Many reports and the usual foreign Notices to Mariners have been received and all were translated by Mr. Leach, the assistant in charge of Notices to Mariners and Light Lists (except those in the Russian language, for which a translation is provided), and the more important information derived therefrom was republished. A large amount of original matter from reports of United States vessels of war, United States consuls, and our correspondents in the merchant marine of various nationalities was also published. Reports from our vessels of war have largely increased as a consequence of the Bureau's Order, No. 18, of 1891.

The index to Notices to Mariners for 1892 was made up for the printer as usual in time to have it issued with the first notice of 1893, but was not received from the printer until March 29, 1893.

Two of the Light Lists, Vols. I and III, were revised and rearranged so that the data for each light now appears on one page, a more convenient and useful form for the mariner than the old one. Taken in connection with the abandonment of vacant or extra numbers and spaces this change of form greatly reduces the size and also the expense of publication of the Light Lists, and it is hoped we can publish in the future at least five of our present Light Lists. The new edition of Light List, Vol. I, was published and issued, corrected to April, 1893; also that of Vol. III, corrected to May, 1893. Vols. IV and V are now being revised and prepared to appear in the new form, as Vol. IV.

MARINE METEOROLOGY.

The division of marine meteorology was in charge of Lieut. Commander E. W. Sturdy, U. S. Navy, during the past fiscal year until he was ordered to the U. S. S. *Michigan*, on November 10, 1892. Lieut. R. G. Davenport, U. S. Navy, took temporary charge from that date until Lieut. W. H. Beehler, U. S. Navy, reported for duty on December 15, 1892.

Mr. T. S. O'Leary has satisfactorily performed the work of plotting the storm tracks and writing the weather review, which was formerly done by Mr. Hayden.

Improvements in the minor details of the Pilot Chart have been introduced as time and experience have evolved them.

In October, 1892, the tabular statement of normal barometer readings was replaced by a subchart showing the curves, for every tenth of an inch, of equal, normal barometer pressure. In May, 1893, these isobars were extended to every five-hundredths of an inch, and isotherms for every 5 degrees of air temperature were drawn on this chart. These curves of isobars and isotherms have been of value in affording a graphic means of illustrating the general laws of atmospheric movement and wind circulation on the principles of modern meteorology, and in furnishing a practical presentation of the meteorological conditions for the use of coöperating mariners.

In March and April the path of the total eclipse of the sun was plotted on the chart in order to ascertain its effects upon the meteorological condition.

Supplements to the monthly Pilot Charts were issued occasionally, viz: In July, 1892, on "The North Atlantic ice on the Grand Banks, reported since May 1, 1892;" in November, a series of eight synoptic charts illustrating the meteorological conditions of the storm of November 21–28, 1888; in January, 1893, the proposed Mediterranean transatlantic steamship route; and on February 23, 1893, a "Wreck chart of the North Atlantic coast of America," showing for the period of five years the names and positions of all wrecks, with a tabulated statement giving the first and last positions and the distances traveled by drifting derelicts, and a similar statistical statement setting forth that there are on the average always 16 derelicts adrift in the North Atlantic, and that there are on the average 8 collisions with derelicts every year. These facts have called attention to the necessity of the removal of these derelicts, and the U. S. S. *Dolphin* and *Fern* have recently torpedoed several of these dangerous obstructions near the coast.

Reports of marine meteorology of all kinds have been regularly received from voluntary coöperating observers in merchant vessels and vessels of war of all nationalities, from light-house keepers on the United States coast and that of Newfoundland, and from observers in the West Indies and other islands. Reports of Greenwich noon observations have been received from 2,844 observers, an increase of over 300 during the past year. Numerous other reports have been received, both on the prescribed form and in letters addressed to the office. The prescribed forms include the following reports, viz: ice and ice movements, tradewinds, waterspouts, fogs, derelicts, wrecks, wreckage, buoys adrift, ocean currents, reports by bottle papers, best sailing routes, steamer routes, track charts, barometer comparisons, abstract storm log, Greenwich noon observations, meteorological journals, reports on the use of oil, auroras, thunderstorms, electrical phenomena, and general information.

Many of the observers report by letters written in foreign languages, and these are translated and utilized.

The issue of the monthly Pilot Chart has increased to 3,700 copies each month, and the office is unable to supply the demand for back numbers.

Since last February all the accumulated data in the office, consisting of over 4,000 log books, voluminous daily weather maps from all foreign countries, and many kinds of meteorological publications, have been systematically arranged and classified. A register and card catalogue have been introduced, and meteorological information received in the Navy Department library, and embodied in books of reference in other divisions, are made available for ready reference in this division.

The card catalogue system consists of the distribution of the meteorological data under three separate departments: Meteorology, oceanography, and shipping. Each of these departments has a number of divisions and each division a number of branches, so that any subject relating to marine meteorology finds its proper place, and all the information is available for immediate use.

The files of this division contain a vast amount of data which should be compiled on synoptic charts for the preparation and publication of pilot charts of other oceans.

Projects for the extension and improvement of this division are under consideration. Lieut. Beehler, U. S. Navy, who has charge of the division, has done much to improve the work, and shows especial zeal in his desire to advance the character of the publications.

BRANCH HYDROGRAPHIC OFFICES.

Port Townsend.—On December 1, 1892, the branch hydrographic office at Port Townsend, Wash., was established under the supervision of Lieut. H. T. Mayo, U. S. Navy, with quarters in the customhouse. This office has at once stepped into a field of active usefulness to the maritime community of Washington, since Port Townsend is one of the principal ports of entry for the Puget Sound customs district, and has a number of entrances and clearances only exceeded in three other ports of the United States.

Chicago.—On April 26, 1893, the branch office at Chicago was established. It was at first located in the model battleship *Illinois*, since, previous to the official order establishing this branch, it was the exhibit of the Hydrographic Office at the World's Columbian Exposition. Under the supervision of Ensign George P. Blow, U. S. Navy, this office is being established on a firm basis, and the wants of those engaged in commerce on the Great Lakes is being studied. The office is quartered in the Masonic Temple building.

The work of the branch offices during the past year has been beneficial to the maritime and mercantile community. They enable the Hydrographic Office to learn the wants of navigators and to collect and supply information. Many new meteorological observers have been gained, the demand for notices to mariners has been greatly increased, and the Pilot Chart, with its constant and noted improvements, is having a widely increased circulation. The services of the officers in charge of the branch offices have been called into use to determine all kinds of questions of a nautical nature, and the professional knowledge given has been of great value to the marine insurance companies, shipping agents, admiralty lawyers, and to every branch of business connected with maritime affairs. The reports of the branch offices show them under obligations to many private individuals, to public officials, boards of trade, shipping firms, chambers of commerce, and other maritime associations for many acts of kindness and courtesy.

The following memoranda and table give a brief summary of the condition and principal work done by each branch office:

Boston.—Lieut. W. H. Everett, U. S. Navy, was in charge during the year. The work of this branch has increased and is appreciated by the seafaring community. The Pilot Chart has been in demand and is used extensively by masters of vessels as a track chart. It is recommended that this office have the services of a steam launch from the navy-yard for a few hours daily, as vessels at anchor are inaccessible to the ship visitor.

New York.—Lieut. A. Marix, U. S. Navy, has been in charge of this office during the entire year. The routine work has been kept well up to date. Circular letters have been sent out to masters of vessels regarding the collection of data for coastwise and ocean routes in the North and South Atlantic Oceans, the West Indies, and the Mediterranean Sea, and much information has been collected in regard to the proposed ocean routes to and from New York and Gibraltar, which appear on the monthly Pilot Chart. Much valuable information was collected for the Wreck Chart of the Atlantic coast of America. A complete set of British admiralty charts is now on file in this office. Many additional meteorological observers have been secured.

Philadelphia.—Lieut. R. M. Hughes, U. S. Navy, has been in charge. The exceptionally severe weather of the past winter interfered to a certain extent with the distribution of Hydrographic Office publications, but few sailing vessels being able to reach Philadelphia during the months of December, January, and February. The time ball is dropped from the Maritime Exchange. Many new meteorological observers have been secured, and the facilities for obtaining nautical information have been very generally taken advantage of.

Baltimore.—Lieut. A. C. Almy, U. S. Navy, was in charge until December 3, 1892, when he was relieved by Lieut. H. O. Dunn, U. S. Navy. The boarding of vessels has been rendered difficult because of the extended and widely separated anchorages in the harbor. A small tug or steam launch, hired by the year, to be used three or four times a week, would be of great advantage and could be obtained for a reasonable sum. The Baltimore Sun's steamer, *Sunbeam*, has often been placed at the disposal of this office for visiting ships. The time ball has been dropped regularly from the Baltimore and Ohio Railroad building, but can not be well seen from the harbor. Through the courtesy of the general agent of the Northern Central Railroad Company steps have been taken to establish a time ball, free of expense, on elevator No. 1, belonging to that company, in full view of shipping. Both balls will be dropped from this office.

Norfolk.—Lieut. Simon Cook, U. S. Navy, has been in charge during the year. A clock regulated to standard time from the U. S. Naval Observatory at Washington has been installed during the year and is of much use for regulating chronometers. A telephone service has also been installed, by which communication has been established between this office and Newport News, Hampton Roads, and other points. The increased number of publications distributed bears evidence of the usefulness of this office.

Savannah.—Mr. Clarence Hatch, at present clerk to this branch, was in charge from July to November, 1892, and Lieut. T. W. Ryan, U. S. Navy, until February 28, 1893, when he was relieved by Ensign A. H.

Seales, U. S. Navy. The importance of this office is increasing, but the quarters furnished at the customhouse are inadequate. The busiest part of the year is during the fall and winter months when the cotton trade is active. The hydrographic forecast of weather is printed in the leading papers of South Carolina and Georgia. Thanks are due to the weather observers at Savannah and Charleston, the collector of the port, and customhouse officials. The captains of all steamers belonging to the Ocean Steamship Company are meteorological observers, and send in much important marine data to this office.

New Orleans.—Lieut. W. S. Hughes, U. S. Navy, has been in charge during the year. The usefulness of this branch is constantly attested to by those interested in maritime affairs. The time ball has been dropped with regularity, but its visibility from the harbor would be much increased if it were removed from the Cotton Exchange to the customhouse. The newspapers of New Orleans printed in English, German, French, and Italian, and those of Pascagoula, Mobile, Pensacola, Tampa, and other parts, have frequently thrown open their columns to everything of use to the maritime world emanating from the Hydrographic Office. Many courtesies have been received from the Maritime Association of New Orleans, which furnishes free office rooms, from the Western Union Telegraph Company, and from the press of the entire Gulf coast. All have shown continued interest in the work of this office.

San Francisco.—Lieut. T. Dix Bolles, U. S. Navy, remained in charge until his death, which occurred on August 20, 1892. On October 3, Lieut. J. C. Burnett, U. S. Navy, was ordered in charge. Special bulletins containing the latest and most important information are published monthly. The San Francisco press daily prints maritime data furnished through this branch, and shipowners, insurance men, and many others daily testify to the increasing value of the hydrographic information furnished. The time ball on Telegraph Hill has been dropped regularly. A station has been established on Pitcairn Island, which will furnish full and complete meteorological reports. The present quarters at the Merchants' Exchange are cramped, but the location is such a desirable one that no change is recommended.

Portland.—Lieut. O. E. Lasher, U. S. Navy, was in charge until April 10, when he was relieved by Lieut. C. G. Calkins, U. S. Navy. The chamber of commerce has offered quarters in its new building and this branch office will soon be located there. The Hydrographic Office publications have been in great demand, and many new meterological observers secured.

The correspondence connected with the supervision of the branch offices, the mailing of the monthly Pilot Charts, weekly bulletins, and notices to mariners, and the direction of all printing and binding was in charge of Lieut. John E. Craven, U. S. Navy, until September 10, 1892, and in charge of Mr. R. L. Lerch from that date until he was relieved by Lieut. H. W. Harrison, U. S. Navy.

Principal work done by the branch hydrographic offices for the fiscal year ending June 30, 1893.

	Boston.	New York.	Philadelphia.	Baltimore.	Norfolk.	Savannah.	New Orleans.	San Francisco.	Portland.	Port Townsend.	Total.
Vessels visited	1,657	2,282	1,055	1,232	44	551	109	23	117	129	7,199
Barometers compared and adjusted	1,309	6,122	907	821	341	132	162	540	......	22	10,365
Chronometers compared and rated	......	14	......	395	......	4	3	7	......	......	323
Charts distributed and corrected for merchant captains	......	108	1,516	131	1,283	89	7	69	......	25	3,228
Light lists corrected and distributed	1,167	201	23	376	338	231	128	43	114	30	2,651
Buoy lists corrected and distributed	4,696	237	843	580	646	318	342	21	104	172	7,059
General information	15	......	49	389	8,016	273	865	1,347	......	215	11,169
General information to individuals	12,167	......	31,237	1,942	1,888	1,666	853	14,301	1,510	212	54,876
Pilot Charts distributed	3,652	10,810	3,003	1,800	1,555	731	822	162	5	54	22,594
Supplements to Pilot Charts distributed	1,184	3,668	681	307	550	153	738	50	18	8	7,357
Notices to Mariners distributed. (Extracts)	245,313	*59,368	347,463	64,560	28,576	55,371	111,272	44,918	20,430	2,372	979,743
Meteorological forms distributed	320	1,345	267	113	137	188	82	283	13	87	2,835
Coast Survey Notices to Mariners distributed	3,301	2,140	......	77,496	18,472	6,285	14,925	541	649	2,372	126,181
Weather reviews distributed	735	1,015	883	114	129	47	131	55	4	42	3,155
Reports on storms at sea, fog, ice, trade winds, shoals, etc., received	5,426	8,917	3,989	1,033	80	280	291	801	42	119	21,150
Hydrographic Office and miscellaneous reports distributed	25,931	11,446	12,362	7,960	4,334	3,176	1,276	13,006	462	291	80,244

* Number of copies of Notices to Mariners.

RECOMMENDATIONS.

Attention is asked to the necessity, which has been frequently urged before, of providing a building suitable for carrying on the work of the Hydrographic Office.

Means are sought for publishing a pilot chart of the Pacific Ocean. The proposal to publish this chart is regarded with satisfaction on the Pacific coast. The outlay would soon be warranted by the collection of information concerning the winds and currents, and the best routes to make the most economical passages.

At the opening of navigation on the Great Lakes in 1894 the U. S. S. *Michigan* could be advantageously employed in surveying the approaches to the Detroit River.

A copy of the annual estimates is inclosed.

Very respectfully,

C. D. SIGSBEE,
Commander, U. S. Navy, Hydrographer.

CHIEF OF BUREAU OF NAVIGATION,
Navy Department.

E.

ESTIMATE OF APPROPRIATIONS REQUIRED FOR THE SERVICE OF THE FISCAL YEAR ENDING JUNE 30, 1895, BY THE BUREAU OF NAVIGATION, NAVY DEPARTMENT.

FOR THE SUPPORT OF THE BUREAU OF NAVIGATION.

Salaries, Bureau of Navigation.

One chief clerk (March 3, 1893)	$1,800.00
Four clerks of class four (March 3, 1893)	7,200.00
Three clerks of class three (March 3, 1893)	4.800.00
Three clerks of class two (March 3, 1893)	4,200.00
Four clerks of class one (March 3, 1893)	4,800.00
One clerk (March 3, 1893)	1,000.00
One copyist (March 3, 1893)	900.00
One copyist (March 3, 1893)	720.00
One assistant messenger (March 3, 1893)	720.00
Three laborers at $660 each (March 3, 1893)	1,980.00
One clerk of class two (submitted)*	1,400.00
Total	29,520.00

I.—*Salaries, Hydrographic Office.*

Two clerks of class 2 (appropriated)	$2,800.00
One clerk of class 1 (appropriated)	1,200.00
One assistant messenger (appropriated)	720.00
One watchman (appropriated)	720.00
Draftsmen, engravers, assistants, nautical experts, computers, custodian of archives, copyists, copper-plate printers, printers' apprentices, and laborers in the Hydrographic Office (appropriated)	40,000,00
Total	45,440,00

II.—*Contingent and miscellaneous expenses, Hydrographic Office.*

Purchase of copper plates, steel plates, chart paper, electrotyping copper plates, cleaning copper plates, tools, instruments, and materials for drawing, engraving and printing, materials for and mounting charts, data for charts and sailing directions, reduction of charts by photography, photolithographing charts for immediate use, transfer of photolithographic and other charts to copper, care and repairs to printing presses, furniture, instruments and tools, extra drawing and engraving; translating from foreign languages; expert marine, meteorogical, and other work in the preparation of the Pilot Chart and supplements, and the printing and mailing of the same; purchase of, compiling, and arranging data for charts and sailing directions and other nautical publications; and works and periodicals relating to hydrography, marine meteorology, navigation, and surveying (appropriated)	30,000.00
Rent of building for printing presses, draftsmen, and engravers, storage of copper plates and materials used in the construction and printing of charts; repairs and heating of the same, and for gas, water, and telephone rates (appropriated)	1,500.00

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*The work of the Bureau has increased so much during the past two years that it is impossible to carry on the current work and keep up the records with the clerical force now allowed.

Contingent expenses of branch offices at Boston, New York, Philadelphia, Baltimore, Norfolk, Savannah, New Orleans, San Francisco, Portland (Oregon), Portland (Me.), Chicago, and Port Townsend, including furniture, fuel, lights, rent, and care of offices, car fare and ferriage in visiting merchant vessels, freight, express, telegrams, and other necessary expenses incurred in collecting the latest information for the Pilot Chart, and for other purposes for which the offices were established, including $1,000 for rent of office in New York (appropriated)	$16,500.00
For a monthly pilot chart of the Northern Pacific Ocean, showing graphically the matters of value and interest to the maritime community of the Pacific coast, and particularly the directions and forces of the winds to be expected during the month succeeding the date of issue; the set and strength of the currents; the feeding grounds of whales and seals; the regions of storm, fog, and ice; the positions of derelicts and floating obstructions to navigation, and the best routes to be followed by steam and by sail, including the expenses of communicating and circulating information; lithographing and engraving; the purchase of materials for and printing and mailing the charts; the employment of three nautical experts, at $1,600 each, and two tabulators and copyists, at $720 each (submitted)	10,000.00

FOR THE NAVAL SERVICE.

I.—*Gunnery exercises.*

For prizes for excellence in gunnery exercises and target practice; diagrams and reports of target practice; for the establishment and maintenance of targets and ranges; for hiring established ranges, and for transportation to and from ranges (appropriated)	6,000.00

II.—*Ocean and lake surveys.*

For ocean and lake surveys; the publication and care of the results thereof; the purchase of nautical books, charts, and sailing directions and freight and express charges on same; preparing and engraving on copper plates the surveys of the Mexican coasts, and the publication of a series of charts of the coast of Central and South America (appropriated)	14,000.00

III.—*Outfits for naval apprentices.*

For bounties for outfits of 750 naval apprentices, at $45 each (appropriated)	33,750.00

IV.—*Transportation, recruiting and contingent, Navigation.*

For expenses of recruiting for the naval service; rent of rendezvous and expenses of maintaining the same; advertising for men and boys; printing, and all other expenses attending the recruiting for the naval service, and for the transportation of enlisted men and boys at home and abroad; for heating apparatus; for receiving and training ships, and extra expenses thereof; for freight, use of telephones, telegraphing on public business, postage on letters sent abroad, ferriage, ice, apprehension of deserters and stragglers, continuous-service certificates, discharges, good-conduct badges and medals for boys; books, stationery, educational appliances, and musical instruments for training ships; packing boxes and materials, and other contingent expenses and emergencies arising under cognizance of the Bureau of Navigation, unforeseen and impossible to classify (appropriated)	45,000.00

V.—*Naval Training Station.*

For dredging channels, repairs to main causeway, roads and grounds, extending sea wall, and the employment of such labor as may be necessary for the proper care and preservation of the same; for repairs to wharf and sea wall; for repairs and improvements on buildings; heating, lighting and furniture for same; books and stationery, freight, use of telephones, and other contingent expenses; purchase of food and maintenance of live stock; and mail wagon and attendance on same (appropriated)	30,000.00
For barracks, wash and bath houses and out buildings for apprentices (submitted)	125,000.00
For quarters for commandant of training station (submitted)	15,000.00
Total	170,000.00

VI.—*Naval War College and Torpedo School.*

For maintenance of the Naval War College and Torpedo School on Coaster's Harbor Island, and care of grounds for same (appropriated)	$8,000.00

VII.—*U. S. Naval Academy—Pay of professors and others.*

For one professor of mathematics, one of chemistry, and one of physics, at $2,500 each (appropriated)	7,500.00
For two professors (assistants) namely, one of French and Spanish, and one of English studies, history and law, at $2,200 each (appropriated)	4,400.00
For five assistant professors, namely, one of English studies, history and law, three of French, and one of drawing, at $1,800 each (appropriated)	9,000.00
For one sword master, at $1,500, and two assistants, at $1,000 each (appropriated)	3,500.00
For one boxing master and gymnast (appropriated)	1,200.00
For one assistant librarian (appropriated)	1,400.00
For one secretary of the Naval Academy (appropriated)	1,800.00
For two clerks to superintendent, at $1,200 and $1,000 respectively (appropriated)	2,200.00
For one clerk for the commandant of cadets (appropriated)	1,200.00
One clerk to paymaster (appropriated)	1,200.00
One dentist (appropriated)	1,600.00
One baker (appropriated)	600.00
One mechanic in department of physics and chemistry (appropriated)	730.00
One cook (appropriated)	325.50
One messenger to superintendent (appropriated)	600.00
One armorer (appropriated)	619.50
One chief gunner's mate (appropriated)	529.50
One quarter gunner (appropriated)	433.50
One coxswain (appropriated)	469.50
One seaman in department of seamanship (appropriated)	397.50
One attendant in department of astronomy and one in department of physics and chemistry, at $300 each (appropriated)	600.00
Six attendants at recitation rooms, library, store, chapel, and offices, at $300 each (appropriated)	1,800.00
One bandmaster (appropriated)	528.00
Twenty-one first-class musicians, at $348 each (appropriated)	7,308.00
Seven second-class musicians, at $300 each (appropriated)	2,100.00
Services of organist at chapel (appropriated)	300.00
*Increase of pay of quarter gunner, to amount allowed by law (submitted)	36.00
Total	52,407.00

Special course of study.

For special course of study and training of naval cadets, as authorized by act of Congress approved August 5, 1882 (appropriated)	3,000.00

For pay of watchmen, mechanics, and others.

For captain of the watch and weigher, at $2.50 per diem (appropriated)	$912.50
For four watchmen, at $2.00 per diem each (appropriated)	2,920.00
For foreman of gas and steam heating works of Academy, at $5.00 per diem (appropriated)	1,825.00
For labor at gas works and steam buildings, for masons, carpenters, and other mechanics and laborers, and for care of buildings, grounds, wharves, and boats (appropriated)	37,864.95
For one attendant in purifying house of gas house, at $1.50 per diem (appropriated)	547.50
Total	44,069.95

For pay of steam employés, Naval Academy.

For pay of mechanics and others in department of steam engineering (appropriated)	7,824.50

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* Increase asked in order that his pay may be made equal to that of a quarter gunner in general service. His present pay was that given to such quarter gunner before the last increase.

For repairs and improvements, Naval Academy.

For necessary repairs of public buildings, pavements, wharves, and walls, inclosing the grounds of the Naval Academy; improvements, repairs, furniture and fixtures (appropriated)	$21,000.00

Heating and lighting, Naval Academy.

For fuel and for heating and lighting Academy and school ships (appropriated)	$17,000.00

Contingent and miscellaneous expenses.

For purchase of books for library (appropriated)	$2,000.00
For stationery, blank books, models, maps, and text books for use of instructors (appropriated)	2,000.00
For expenses of board of visitors to Naval Academy; being mileage, and $5.00 per diem for each member, for expenses during actual attendance at the Academy (appropriated)	1,500.00
For purchase of chemicals, apparatus, and instruments in department of physics and chemistry, and for repairs of same (appropriated)	2,500.00
For purchase of gas and steam machinery, steam pipe and fittings; rent of buildings for use of the Academy; freight, cartage, water, music, musical and astronomical instruments; uniforms for the bandsmen; telegraphing, feed and maintenance of teams; current expenses and repairs of all kinds, and for incidental labor and expenses not applicable to any other appropriation (appropriated)	32,000.00
For stores in department of steam engineering (appropriated)	800.00
For materials for repairs in steam machinery (appropriated)	1,000.00
Total	41,800.00

For improvement of water front.

*For improvement of the water front of the Academy—to be immediately available (submitted)	10,000.00

RECAPITULATION—NAVAL ACADEMY.

For pay of professors and others	$52,407.00
For special course of study	3,000.00
For pay of watchman and others	44,069.95
For pay of steam employés	7,824.50
For repairs and improvements	21,000.00
For heating and lighting Naval Academy	17,000.00
For contingent and miscellaneous expenses	41,800.00
For improvement of water front	10,000.00
Total	197,101.45

RECAPITULATION.

FOR THE SUPPORT OF THE BUREAU OF NAVIGATION.

A.— I.	Salaries, Bureau of Navigation	$29,520.00
B.— I.	Salaries, Hydrographic Office	45,440.00
B.—II.	Contingent and miscellaneous expenses, Hydrographic Office	58,000.00
	Total	132,960.00

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*This amount is necessary for improvement of new grounds purchased by authority of act of Congress of 1890, and for continuing the sea wall.

FOR THE NAVAL SERVICE.

I.	Gunnery exercises	$6,000.00
II.	Ocean and lake survey	14,000.00
III.	Outfits for naval apprentices	33,750.00
IV.	Transportation, recruiting and contingent navigation	45,000.00
V.	Naval training station	170,000.00
VI.	Naval war college and torpedo school	8,000.00
VII.	Naval Academy	197,101.45
	Total	473,851.45

SCHEDULE OF BIDS RECEIVED AND CONTRACTS MADE DURING THE FISCAL YEAR ENDING JUNE 30, 1893.

For rebuilding the gymnasium at the Naval Academy, Annapolis, Md., under advertisement August 16, 1892.

Sanders & Fox	$18,782.20
Ashton S. Tourison	22,250.00
George H. Morrow & Son*	16.351.51
Lewis J. Gardner	17,704.00

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*Accepted.

ANNUAL REPORT

OF

THE CHIEF OF THE BUREAU OF ORDNANCE.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,
Washington City, October 2, 1893.

SIR: I have the honor to submit the annual report of this Bureau. and also to transmit estimates for the fiscal year ending June 30, 1895, The Bureau was under the direction of Commander William M. Folger, U. S. Navy, until January 1, 1893, at which time he resigned the position of Chief of Bureau.

ESTIMATES.

(1) Fuel, tools, material and labor, expenses of target practice, maintenance of new proving ground; modern battery for *Hartford*	$350,000.00
(2) General repairs to Ordnance buildings, machinery, magazines, and appendages	47,900.00
(3) Freight and miscellaneous expenses	8,000.00
(4) Civil establishment at Navy-Yards	26,824.00
(5) Arming and equipping Naval Militia	25,000.00
(6) Machinery for Gun Plant, Washington Navy-Yard	117,000.00
(7) General expenses of the Torpedo Station	71,077.00
(8) Toward the armanent of vessels authorized	6,500,000.00
Total	7,145,801.00

BREECH-LOADING RIFLES.

No change has been made in the general system of construction.

The following table shows the status of the guns required to arm new vessels thus far authorized:

Caliber of gun.	Number of forgings.		Number of guns completed to date.	Number of guns partly completed.	Number of guns afloat.
	Ordered.	Delivered.			
4-inch	107	77	55	20	34
5-inch	86	56	37	19	26
6-inch	141	141	135	6	96
8-inch	68	52	33	19	20
10-inch	26	25	25	0	10
12-inch	13	8	8	0	2
13-inch	12	9	5	3	0
Total	453	368	298	67	188

Of the 453 guns of calibers from 4-inch to 13-inch ordered, 298 have been completed and 188 are already afloat.

The 13-inch gun has not yet been tested, difficulty in obtaining satisfactory steel castings having greatly delayed the completion of its mount. Forgings for nine of these guns have been received.

The hand working breech mechanism referred to in the last report, and which was devised by Lieut. F. F. Fletcher, U. S. Navy, has now been adopted for all guns of 8-inch caliber and above, and is very simple and efficient.

The special furnace for assembling the 8-inch nickel steel gun has been received, and this gun will soon be completed.

The use of metallic cartridge cases in the 6-inch caliber has been definitely decided upon, and a contract has been entered into with the Winchester Repeating Arms Company of New Haven, Conn., for 3,000 such cases. Two 6-inch breech closures, one of the Dashiell type and similar to the 4 and 5 inch mechanisms, the other of a design by Lieut. F. F. Fletcher, U. S. Navy, are being tried on the 6-inch gun. The 6-inch cases will be fitted with electric primers.

The previous order for 5-inch metallic cases having been filled, a further order for 5,000 of these cases, but having electric instead of percussion primers, has been placed with the Winchester Repeating Arms Company. A simple electric firing attachment has been devised and will be applied to the 5 and 6 inch R. F. guns.

The following table shows the present condition of the work upon secondary battery guns for the new vessels:

Gun.	Kind.	Number ordered.	Number completed.	Ordered but not delivered.	Number afloat.
37-millimeter	Hotchkiss	49	49	0	32
47-millimeter	do	14	14	0	6
1-pounder	do	91	66	25	46
	Driggs	15	0	15	0
3-pounder	Hotchkiss	36	36	0	33
	Driggs	10	10	0	2
6-pounder	Hotchkiss	150	150	0	56
	Driggs	115	35	80	29
Total		480	360	120	204

FIELD GUNS.

Six more 6-pounder field guns with Driggs-Schroeder breech mechanism are being made at the Washington Navy-Yard for the use of the cadets at the naval academy and apprentices of the training squadron.

The 25 per cent nickel steel forging referred to in the last report as ordered for a 3-inch field gun proved of unsatisfactory physical qualities and was condemned. A new forging of ordinary steel has been ordered for this experimental field gun.

HURST 8-INCH GUN.

In accordance with the following provision in the act of Congress approved July 19, 1892:

> To enable the Secretary of the Navy, in his discretion, to manufacture at the Washington Navy-Yard, after approval of designs to be furnished by the inventor, one 8-inch fifty caliber high-power rifle, wire wrapped, or built up and hooped, chambered to load with a primary and main charge, insuring a progressive burning of the charge, and firing a high explosive projectile with great velocity, and to test the same.

The Department has decided to manufacture the said gun, and on January 28, 1893, entered into an agreement with Mr. H. P. Hurst, of the State of Mississippi, for the exclusive right on the part of the Government to manufacture, by contract or otherwise, such guns and ammunition without payment of any royalty on the same; the option of the Government to acquire such right to be exercised within 60 days from the conclusion of the tests of the sample gun and its ammunition.

The designs submitted by Mr. Hurst having been approved by the Department, the necessary forgings for this gun were ordered, after advertisement, from the Bethlehem Iron Company, and the manufacture of the gun and ammunition has been begun at the Washington Navy-Yard.

POWDER.

The manufacture of brown powder for the Navy has been continued by Messrs. E. I. Du Pont & Co., of Wilmington, Del., and during the year a first lot of brown powder for the 6-inch gun has been successfully manufactured by the California Powder Company of Santa Cruz, Cal.

Continued difficulty is experienced in meeting the requirements of velocity and pressure in the larger calibers, and the progress made in their development is far from satisfactory.

The experimental work with smokeless powder has been continued at the naval torpedo station at Newport, R. I., and also at the gun cotton works of Messrs. Du Pont & Co., but a point has not yet been reached in its development which would justify the issue of this powder to the service.

STOWAGE OF MAGAZINES AND THE SUPPLY OF AMMUNITION ON BOARD SHIP.

The system of stowing ammunition on board ship is at the present time reduced to the simplest form, it being stowed, up to and including 8-inch caliber, in bins and held in place by removable battens.

The solid lining of magazines has been found to be detrimental to the preservation of the steel floors, owing to the impossibility of keeping these surfaces properly painted and dry. The Bureau has therefore directed that the floors of ammunition rooms shall be laid with removable gratings and the sides and ceiling with removable battens. This will allow the metal work of ammunition rooms to be properly cared for.

The packing cases for rapid-fire ammunition are now built up in pieces, as it has been found that the bored-out boxes are liable to warp and become deformed.

The supply of ammunition to the guns will be kept up by mechanical hoists worked by steam or electricity; the first of this class of hoists has been installed on the *New York*, and, with some slight modifications, will prove satisfactory.

The Bureau has called to the attention of the Department the danger of overheating the magazines of various ships, and the consequent deterioration of the powder due to the proximity of the magazines to the fire rooms.

GUN MOUNTS.

The successful trial on shipboard of the 10 and 12 inch mounts of the *Monterey* under ordinary conditions of service has confirmed the

Bureau of the wisdom of its choice in adopting the same type for the 13-inch mounts of the battleships. The castings for three of these mounts are now being made and nine other sets are contracted for.

The four 12-inch mounts of the *Puritan* are three-fourths completed; one has been tested at the naval proving ground and two of them are now being set up in the shops at the naval gun factory. One complete set of castings for the *Texas* two 12-inch mounts, has been received and the parts are ready for machining.

Three of the *Maine's* 10-inch mounts have been tested at the naval proving ground and the fourth one is being set up. They are all practically ready to be put in place on board ship. Nearly all of the castings for the *Amphitrite* and *Monadnock* have been received and two of the *Amphitrite's* mounts are now being set up in the shops and will soon be ready for proving. The pneumatic mounts of the *Terror* have been completed and now await trial.

The battery of the *New York* has been installed and, with the exception of some minor fittings, now awaits trial.

Drawings of a new design for 8-inch carriages have been completed and patterns for the castings are now being made at the naval gun factory. These guns are made to recoil in the line of fire and are returned to battery by springs as in the smaller rapid-fire mounts. This arrangement reduces the downward thrust on the decks to a minimum and obviates the necessity of cutting large ports in turrets and shields, thereby lessening the exposure of the gun's crew to small-arm and machine-gun fire.

MAIN BATTERY MOUNTS.

Caliber.	Completed at this date.	Ordered, not completed.
13-inch		12
12-inch	5	7
10-inch	*17	5
8-inch	22	44
6-inch	115	11
5-inch	33	35
4-inch	45	53

* Includes four contracted for *Terror*.

The Bureau has tested at the naval proving ground a 4-inch rapid-fire mount, with the directing bar removed and training wheels on each side of the top carriage, an elevating wheel in the line of sight on the left of the gun, and has concluded that this style is capable of easier and more rapid train and elevation. This form of mount will be placed in the *Hartford* and other old ships refitting with modern batteries, and in new ships where the sponson armor is not too far advanced to admit of the change.

MODERN BATTERY FOR OLD VESSELS.

The Department has authorized the placing of modern batteries on board the *Hartford* and she will be armed as follows:

Thirteen 5-inch, four 6-pounders, and two 10-pounder field guns.

The *Essex* is being fitted with a battery of eight rapid-fire 4-inch guns, two 6-pounders, and two 1-pounders. These guns are supplied under the act of June 30, 1890, providing for the armament with modern batteries of a gunnery training ship.

The *Atlanta* is to have a number of changes made in her battery. The 6-inch shifting-pivot carriage in the ends of her superstructure will be removed and 6-inch central-pivot carriages placed in these corners, having an arc of train of 135 degrees from right ahead and right astern.

The secondary battery will be changed to an efficient battery of but two classes of small guns, replacing the secondary battery now in her, which contains two of every class of small guns furnished the Navy. This change will avoid the multiplicity of different kinds of ammunition and give her a modern secondary battery.

The *Chicago's* secondary battery has been changed to a battery of the latest guns and mounts.

PROJECTILES.

During the year further contracts for forged steel armor-piercing shell have been entered into by the Department with the Carpenter Steel Company, of Reading, Pa., and the Sterling Steel Company, of Demmler, Pa.

The following table shows the status of these and the previous orders for armor-piercing shell:

Caliber.	Ordered.	Delivered.	Due.
4-inch	2,100	100	2,000
5-inch	1,350	0	1,350
6-inch	2,184	2,184	0
8-inch	1,957	1,557	400
10-inch	1,033	733	300
12-inch	541	115	426
13-inch	500	0	500

The shell delivered by the above firms are of excellent quality, and against such armor as has been hitherto used their efficiency leaves little to be desired. The advent of hard-faced armor and its probable general adoption, however, necessitate a further development of the armor-piercing projectile, and the Bureau is experimenting with a view to obtaining a shell which will not be broken up on impact with this armor.

Further tests of cast-steel shot have been made, and some experimental 10-inch shot furnished by I. G. Johnson & Co., of Spuyten Duyvil, New York City, have given very satisfactory results.

Forged steel shell for the smaller calibers have been treated by the Harvey process, which has greatly improved their armor-piercing qualities.

Experiments are also in progress in firing shell charged with gun cotton and fulminate primer from high-power guns.

The manufacture of cast-iron projectiles at the Washington navy-yard has been entirely suspended, more efficient shell of wrought steel being supplied by private firms at about the same price.

The United States Projectile Company is still delivering the 4-inch, 5-inch, and 6-inch shell under their contract with the Department. These shells have base fuses and solid points, and have proved very efficient on the firing ground, carrying their bursting charges through steel plates half a caliber in thickness without breaking up, as cast-iron shell would.

Further contracts have been made during the year with the American Projectile Company for 4-inch, 5-inch, 6-inch, 8-inch, 10-inch, and 12-inch wrought-steel shell, and for 4-inch, 5-inch, and 6-inch shrapnel, experimental tests of the 4-inch, 5-inch, and 6-inch shell and shrapnel having proved satisfactory, and the company having agreed to extend its process to the larger calibers.

The Taylor Iron and Steel Company, of High Bridge, N. J., have submitted sample 10-inch and 12-inch cast-steel shell to test, with satisfactory results, and the first lot under their contract is now ready for tests.

Orders have now been placed with the above companies for steel shell and shrapnel sufficient for all ships thus far authorized by law, with the exception of those for the 13-inch B. L. R. of the battle ships.

The condition of the orders for shrapnel and common shell is as follows:

Caliber.	Shrapnel.		Shell.	
	Ordered.	Delivered.	Ordered.	Delivered.
4-inch	2,000	1,000	35,268	12,000
5-inch	2,000	1,000	18,000	14,500
6-inch	3,000	1,000	18,200	8,709
8-inch	....	....	1,500	....
10-inch	....	....	1,256	550
12-inch	....	....	428	....
13-inch	....	....	....	....

ARMOR CONTRACTS.

Since the date of the last report new contracts for armor have been made to include the armor required for all the vessels now authorized by law.

These new contracts include the turret armor for the *Indiana*, the *Massachusetts*, the *Oregon*, and the *Olympia*, the side armor of the *Massachusetts*, and all the armor for the *Iowa* and *Brooklyn*, amounting to 6,489 tons.

The facilities for the manufacture and delivery of armor at the works of each of the contractors have been materially improved, and with further improvements, already commenced and to be completed by the end of the year, the country will have two complete armor plants, each fitted better than any similar plants abroad; and there will hereafter be no difficulty in supplying the armor for vessels as rapidly as it can be needed in the shipyards under any circumstances of building vessels, however rapid.

By the terms of the new contracts the manufacturers are under penalties in case of failure to deliver at the rate of 250 tons each per month.

Up to the date of the last report the Bethlehem Iron Company had delivered 796 tons of armor and the Carnegie Steel Company 715. Since that time, partly owing to increased expertness of workmen and in part to increased facilities, the delivery of armor per month has gradually increased to a satisfactory condition.

The following table presents a summary of the amounts of armor contracted for, delivered, and remaining to be delivered up to October 1, 1893:

Summary of armor contracts to October 1, 1893.

Vessel.	Amount required and ordered.			Amount delivered to October 1, 1893.			Amount still to be delivered.		
	Bethlehem.	Carnegie.	Total.	Bethlehem.	Carnegie.	Total.	Bethlehem.	Carnegie.	Total.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
Amphitrite	311.23	359.39	670.62	172.74	359.39	532.13	138.49		138.49
Monadnock	145.29	504.80	650.09	8.71	168.49	177.20	136.58	336.31	472.89
Terror	337.99	298.66	636.65	312.36	151.83	464.19	25.63	146.83	172.46
Puritan	976.19	118.58	1,094.77	281.04		281.04	695.15	118.58	813.73
Texas	1,025.52		1,025.52	703.85		703.85	321.67		321.67
Maine	1,172.31		1,172.31	506.17		506.17	666.14		666.14
Monterey	160.64	546.62	707.26	160.64	546.62	707.26			
Ram		768.17	768.17		112.10	112.10		656.07	656.07
New York		538.46	538.46		538.46	538.46			
Oregon	710.19	2,002.40	2,712.59	254.15	331.69	585.84	456.04	1,670.71	2,126.75
Massachusetts	2,164.21	552.36	2,716.57	265.09	183.43	448.52	1,899.12	368.93	2,268.05
Indiana	2,337.86	384.63	2,722.49	1,216.52	179.67	1,396.19	1,121.34	204.96	1,326.30
Olympia		224.25	224.25		150.51	150.51		73.74	73.74
Cincinnati		48.40	48.40		48.40	48.40			
Raleigh		47.49	47.49		47.49	47.49			
Montgomery		22.20	22.20		22.20	22.20			
Detroit		21.86	21.86		21.86	21.86			
Marblehead		20.41	20.41		20.41	20.41			
Columbia		77.11	77.11		77.11	77.11			
Minneapolis		89.23	89.23		26.56	26.56		62.67	62.67
Machias		21.17	21.17		4.34	4.34		16.83	16.83
Castine		21.21	21.21		21.21	21.21			
Iowa	906.19	1,721.28	2,627.47				906.19	1,721.28	2,627.47
Brooklyn	113.86	578.62	692.48				113.86	578.62	692.48
Gunboat No. 7			17.00						17.00
Gunboat No. 8			14.00						14.00
Gunboat No. 9			14.00						14.00
Total	10,361.48	8,967.30	19,373.78	3,881.27	3,011.77	6,893.04	6,480.21	5,955.53	12,480.74

For amount of armor to be Harveyized see following tables.

ARMOR DEVELOPMENT.

The quality of the armor delivered during the last year has been excellent, all passing the tests satisfactorily; some of it has earned the lowest premium for increased ballistic properties and latterly all presented has shown ballistic qualities considerably greater than that required by the stipulations of the contracts for acceptance.

When it is taken into consideration that the acceptance tests are more severe than those required by other purchasers of armor, this is a most gratifying result.

The armor delivered during the year has been of nickel steel.

The Department having thoroughly satisfied itself that the application of the Harvey process produces a more resisting armor, arrangements were made early in the year to Harveyize as much of the armor under the old contracts as was not too far advanced in manufacture to admit of the change or would not seriously delay the shipbuilders. Under this arrangement the following armor under the contracts of 1887 and 1890 will be submitted to that process:

Character.	Vessel.	Thickness.	Amount.	Contractor.
		Inches.	*Tons.*	
Side armor	Maine	12	492	Bethlehem Iron Company.
	Texas	12	281	Do.
	Indiana	18	614	Do.
	Oregon	18	614	Carnegie Steel Company.
	Puritan	10–14	475	Bethlehem Iron Company.
Turret armor	Maine	8	135	Do.
	Puritan	8	162	Do.
	Monadnock	7.5	91	Do.
13-inch B. L. R. barbettes	Oregon	17	775	Carnegie Steel Company.
			3,639	

Under the new contracts (1893) all armor will be treated by the Harvey process which it is considered feasible and desirable to so treat.

Character.	Vessel.	Thickness.	Amount.	Contractor.
		Inches.	*Tons.*	
Turrets for	Indiana	15 6	384	Bethlehem Iron Company. Carnegie Steel Company.
	Massachusetts	15 6	384	Bethlehem Iron Company. Carnegie Steel Company.
	Oregon	15 6	384	Bethlehem Iron Company. Carnegie Steel Company.
	Iowa	15 5	588	Bethlehem Iron Company. Carnegie Steel Company.
	Brooklyn	5.5	92	Do.
	Olympia	3.5	28	Do.
Barbettes for	Massachusetts	17 6–8	928	Bethlehem Iron Company. Carnegie Steel Company.
	Iowa	15 6–8	669	Do.
	Brooklyn	4–8	145	Do.
Side armor	Massachusetts	18–8	614	Bethlehem Iron Company.
	Iowa	14–7	630	Carnegie Steel Company.
	Brooklyn	3	155	Do.
Diagonal armor	Iowa	12–7	235	Bethlehem Iron Company.
Casemate armor	Iowa	4	203	Carnegie Steel Company.
Total			5,439	

The process is now being applied to the side armor of the *Maine* and the first ballistic test of a group of this armor for service purposes as distinguished from experimental purposes will take place in the first week of October.

The Bethlehem Iron Company has eight Harvey furnaces in constant use and the Carnegie Steel Company is equipping similar furnaces as rapidly as possible.

Recent experiments at the proving ground demonstrate conclusively that nickel armor will afford more protection than is generally supposed owing to the fact that the line of fire under service conditions will be at an angle to the plate, which is most advantageous to the plate, and also destructive to the projectile. Nickle-steel plates offer great resistance at this angular fire, because of the extra toughness of this material as compared with ordinary steel.

GUN FORGING CONTRACTS.

On June 29, 1893, the Department called for bids for forgings for forty 4-inch, thirty 5-inch, sixteen 8-inch, and five 12-inch guns, these being sufficient to complete the batteries of all ships authorized by law.

The Bethlehem Iron Company was the lowest bidder for the 5-inch and 12-inch forgings, and the Midvale Steel Company for the 4-inch and 8-inch forgings, and contracts were entered into accordingly.

The following table shows the number of sets of forgings of each caliber thus far delivered and still due, under outstanding contracts, in addition to eight sets of 8-inch and three sets of 10-inch forgings, purchased abroad:

Caliber.	Delivered.		Ordered but not delivered.	
	Midvale.	Bethlehem.	Midvale.	Bethlehem.
4-inch	35	42	30	0
5-inch	27	29	0	30
6-inch	84	57	0	0
8-inch	16	28	16	0
10-inch	0	22	0	1
12-inch	0	8	0	5
13-inch	0	9	0	2

ARMAMENT OF NEW VESSELS.

During the year the batteries of the *Monterey*, *New York*, *Detroit*, *Montgomery*, *Marblehead*, *Machias*, *Bancroft*, *Castine* and *Terror* have been installed.

The *Monterey's*, *New York's*, and *Bancroft's* batteries have been tested by firing trials and guns and mountings worked satisfactorily.

SMALL ARMS AND MACHINE GUNS.

The reduction of the caliber of small arms continues abroad. Italy, after exhaustive trials, has adopted the 6.5^{mm} (0.256 inch) caliber as have also Holland and Roumania. Five-millimeter (0.197 inch) arms have been manufactured and tested in several countries, and the weight of opinion points to a caliber of about 6^{mm} (0.236 inch) for the small arm of the immediate future.

Under these circumstances the Department has appointed a board, of which Commander George A. Converse is a senior member, to recommend a caliber and system of small arm for the Navy. The first report of this board, recommending a caliber of 6^{mm} and stating their reasons therefor, has been approved by the Department and will be found appended. It is the Bureau's intention to at once have made rifle barrels and ammunition of 6^{mm} caliber and then to call upon inventors to submit small arms on their systems for competitive test, the finished barrels and ammunition being supplied by the Bureau at cost price.

The test of a 0.30 inch caliber Gatling gun at the Springfield Armory, with a new feed, positive in its action and taking the ammunition directly from the factory packing cases, has been very satisfactory. A report upon this test, made by the Bureau's inspector, Ensign A. C. Dieffenbach, will be found appended.

No difficulty is anticipated in adapting the Gatling or any other machine gun to the 6^{mm} caliber adopted for the Navy small arms. The Colt Automatic Machine Gun, a very light weight one barrel gun, has also been tested recently, and promises to be a very efficient weapon for boat and landing work.

AUTOMOBILE TORPEDOES.

Howell.—Seven torpedoes of this type have been presented by the Hotchkiss Ordnance Company, the contractors, for trial and acceptance, and the balance are ready for assembling. The trials began before members of the Torpedo Board on July 15, and continued until August 2, 1893, when they were temporarily discontinued to await the completion of repairs to the engine of the *Stiletto*, from which these torpedoes must be fired before acceptance. Thirty of these torpedoes have been contracted for with the option of increasing the number to fifty or more. The contractors have established a good firing range in the water opposite Tiverton, R. I., where the torpedoes are being tested and adjusted by the company. The performance of these torpedoes is most satisfactory both in the speed obtained and accuracy. The Bureau anticipates that these torpedoes will be well adapted to use in torpedo boats, owing to the facts that they are lighter and require no air compressors, accumulators, or other appliances which are necessary for the Whitehead torpedoes and which greatly increase the weights to be carried.

Whitehead.—Twenty-eight torpedoes have been accepted. The accepted torpedoes are sent to the Naval Torpedo Station for stowage and care, from whence they will be issued to ships as required.

These torpedoes, it is thought, are equal in every way to those made abroad. The contractors are now in possession of an excellent plant, capable of furnishing all the Whitehead torpedoes and launching apparatus that the Department may see fit to order. They have established a good firing range in Noyack Bay, Long Island, where test and adjustments have been going on during the summer. The balance of the one hundred contracted for are ready for assembling and will be delivered as rapidly as they can be adjusted.

The constant work of these two companies at Tiverton and Noyack Bay in testing and adjusting their torpedoes has furnished excellent opportunities for officers to become familiar with the necessary adjustments and firing trials and the Department has taken advantage of it to order officers to witness them. These officers are first sent in small details to the Torpedo Station where they study in detail the mechanism of both torpedoes. They are then sent in succession to each of the testing stations.

AIR FLASK FORGINGS FOR WHITEHEAD TORPEDOES.

The difficulties which at first attended the manufacture of these have now disappeared. All the forgings required can now be obtained from the Midvale Steel Company and the Bethlehem Iron Company, each of which companies has completed the delivery of fifty forgings.

Hall.—Trials of this torpedo continue at the Torpedo Station. Important modifications in the mechanical details have resulted in marked improvement in its performance.

LAUNCHING APPARATUS.

Howell.—The fifteen launching tubes of different types contracted for have been completed. Their acceptance is contingent upon the acceptance of the torpedoes. Two tubes were placed in the *Stiletto* during the previous year. They have been found to work satisfactorily.

Whitehead.—The launching apparatus contracted for January 25, 1893, and ordered previous to that date from the E. W. Bliss Company, consists of 60 tubes, 53 mounts of different types, together with their appurtenances, 10 air compressors, type 2, 10 accumulators, and 1 small air compressor, special design.

Of this apparatus there remains yet to be delivered 36 tubes, 36 mounts, with appurtenances (except loading trays), and 10 accumulators.

Difficulty has been found in obtaining suitable castings for the broadside connections of lower deck mounts, and the company furnishing the stock of accumulators has been obliged to put in special machinery for making them.

The work of installing Whitehead topedo batteries has already commenced on the *New York*, *Raleigh*, *Cincinnati*, *Montgomery*, and *Marblehead*. The tubes and mounts for the *Ericsson* are in store at the New York navy-yard awaiting the completion of that vessel.

Appliances for handling torpedoes on board ship, such as trolley rails, trucks, switches, turntables, hoists, transporting straps, and tail covers, have been designed and are to be made and tried at the Torpedo Station with a view to adoption into the service.

DIRIGIBLE TORPEDOES.

Patrick.—The Department is in possession of three of these, one stowed at the Torpedo Station and two at the Mare Island navy-yard, California.

Sims-Edison.—One of these is now at the torpedo station, where preparations are in progress for its trial from the tug *Fortune.*

TORPEDO DEFENSE NETS AND FITTINGS.

Experiments are now in progress at the Torpedo Station looking to the adoption of suitable net defenses for our vessels. The *Fortune* has been fitted with the torpedo defense net booms provisionally adopted by the Bureau. Three sections of net, two of which are of American design and manufacture (Midgley Wire Belt Company, Beaver Falls, Pa.), the other the Bullivant design, have been rigged to these booms. Trials to test brailing up, stowing and general handling have been made; steaming trials to determine efficiency of booms and fittings will follow.

The Midgley nets are alike in type, one made of nickel steel wire, the other, a lighter net, made of steel music wire. Experiments so far do not prove that the nickel steel net will not rust, though, from previous tests, it was hoped it would not. As a test of the relative strengths of the three nets, it is purposed to suspend them in the water, and fire at them with projectiles from the *Destroyer's* submarine gun, starting with low charges of powder, then gradually increasing them until each net has been penetrated.

SUBMARINE BOAT.

Congress, having made an appropriation for the purpose of building a submarine boat, proposals were invited by the Naval Department on the 1st of May, and opened on the 20th of June, 1893.

A considerable number of proposals were received, the best being those presented by the J. P. Holland Torpedo Boat Company, of New York, and Mr. George C. Baker, of Chicago, Ill. The designs submitted were referred by the Department to a board for consideration and report.

Mr. Baker had ready for exhibition the boat referred to by the Chief of Bureau in his report for 1892, and, while the designs were under consideration, the board proceeded to Chicago, Ill., to witness another trial of this boat.

The trial took place early in September, 1893, near the entrance to the Calumet River, off South Chicago.

The boat was so imperfect that no satisfactory opinion could be based upon its performance, either for or against the principle of submergence and propulsion involved.

The small size of the rudder and the faulty lines of the after-body of the boat made it impossible to steer it properly, and it also lacked certain mechanical devices which the board considered necessary for a successful performance.

Mr. Holland, of the Holland Torpedo Boat Company, has had considerable experience in designing submarine boats and under a former administration his design was very favorably regarded.

The board considered that the design of the Holland Torpedo Boat Company most nearly met the requirements of the Department's circular and recommended the acceptance of their proposal.

The utility of a submarine boat for war purposes has yet to be demonstrated. The Bureau has recommended the construction of this boat under such guarantees as will secure the Government against loss in case the main features of the requirements are not attained by the builders.

VESUVIUS.

Since the last report the guns of this vessel have been subjected to another trial. The Board conducting the previous trial having recommended changes in the guns and the construction of better projectiles, also placing a range finder on board the vessel. These improvements were made at a cost of $30,000. The report of the last board does not differ materially from that of preceding boards. This report is appended, from which it may be seen that at times the practice with the guns was very satisfactory; but under apparently the same conditions at another time, the practice was not satisfactory. The difficulty in the pneumatic gun as installed on board the *Vesuvius* appears to center in the main valve, which admits the compressed air to the gun. At all ranges of the guns, except those near the maximum, the successful working demands that this valve should remain open but an exceedingly short time, probably a small fraction of a second. The difficulty encountered in accomplishing this has not yet been overcome.

The Bureau is of opinion that radical changes in the system might be made which would greatly improve it, and is informed that the company has this now in hand. It is, however, believed that the guns on board the *Vesuvius* can not be made successful.

It is respectfully recommended that the $450,000 appropriated by the act of March 2, 1889, for building a vessel similar to the *Vesuvius* may be made available for building torpedo boats. If these were contracted for at one time, it is probable that four boats of improved type could be constructed. These would be of undoubted service.

NAVAL TORPEDO STATION.

Commander Converse, now in charge of the station, is also president of the torpedo board.

Messrs. DuPont & Co. have completed their order for 50,000 pounds of gun cotton and it has proved to be of such good quality that the company may be relied upon to furnish it in quantities as may be required. Experimental work in the production of both gun cotton and smokeless powder have been continued at the torpedo station.

On July 3, 1893, the gun-cotton factory was destroyed by fire, a full statement of which will be found in the report of the board appointed to investigate the subject. Three employés, Jeremiah Harrington, first-class laborer; Frank Loughlin, second-class pipe-fitter, and Michael Reagan, first-class laborer, lost their lives while fighting this fire, and it is earnestly recommended that Congress be asked to grant assistance to their families. The employès of this station receive no extra compensation for the undoubted risk to which they are subjected. The fact that so few lives have been lost since the establishment of this station is due to the care which has been constantly exercised. Immediate steps were taken to rebuild the factory on a small scale, and in an improved manner, in order that work upon smokeless powder might be continued without interruption.

The automobile torpedoes are now being supplied to the ships so that the spar torpedo has been discontinued for ships' use. They are, however, still supplied to the steam launches of vessels and this must continue to be done until the service is supplied with torpedo boats capable of carrying automobile torpedoes and possibly even then for ship boats on distant service.

TORPEDO BOARD.

The work devolving upon this board has considerably increased during the past year, owing to the many questions arising concerning the tests of automobile torpedoes and their installation on board the new ships, all of which is new to the service. Careful instruction has been given to a considerable number of officers in connection with the work at the naval torpedo station and the testing grounds and on board the *Cushing* which will prepare these officers for the intelligent care and use of these weapons on board ship.

Trial has been made by the board of a rocket torpedo which may, when fired from the Ericsson gun, prove a valuable weapon. This work is now in progress at the statiòn. Preparations are also being made for the test of a dirigible torpedo from a vessel. While this character of a torpedo may be successfully used from a fixed base from which its course can be directed, it is doubtful whether it can be directed from a ship in rapid motion which may, during the run of the torpedo, be forced to change her own direction.

Tests of torpedo defense nets are also in progress and decided results already obtained.

The new projectiles for the "Ericsson" submarine gun have been received at the station, and are to be tested for accuracy and subsequently the defense nets will be tested by firing these projectiles at them. Should the accuracy of the rocket torpedo prove as exact as is claimed when fired from the submarine gun, it will also be fired at the defense nets.

I beg to renew the recommendation of my predecessor for the reasons which he has given that petroleum be used as the fuel for torpedo boats.

The instruction given to enlisted men at the Washington Gun Shops and the Torpedo Station has continued. It has been extended during the year by instruction on board the *Cushing* where these men have served for a limited time. This vessel has been constantly employed during the past six months in firing Whitehead torpedoes and much important information has been obtained regarding the care and handling of these weapons. The Bureau will be prepared to make useful improvements in the fitting of these torpedoes when another contract is to be made for an additional supply.

NAVAL PROVING GROUND.

During the past year extensive improvements have been made in the facilities of this station. The rapidity with which guns and mounts have been constructed, all of which are proved at this place, has greatly increased the work to be done. The armor is also being delivered with much greater rapidity and has correspondingly increased the work of armor testing. In addition to this, samples of all projectiles manufactured by contract for the Navy are tested at the proving ground. Experiments on firing high explosives, also on fuses, electric firing, gun sights, and much other work have been submitted to the crucial test of actual use. This has all been done by officers at the station with an energy and inteligence deserving commendation.

GUN FACTORY.

The gun shops have been running at their utmost capacity during the past year. Overtime work ceased in accordance with the act of Congress. It has required the utmost exertion to supply the guns, mounts, and equipments as rapidly as required by the new ships. More extended experience in the work has resulted in greater economy in all the branches of manufacture. It has also made evident the direction in which additions must be made to the plant in order to increase its efficiency and make it equal to the demands which may be made upon it.

The breech-mechanism shop is now completed and in complete working order. The necessity for more working space was met by the act of Congress providing for the removal of the forge shop to another building and fitting up the present forge shop for an extension of the mount shop. This work is in progress, but an additional appropriation is required and asked for this year to complete it.

Much difficulty has been experienced in obtaining suitable steel castings for gun mounts. Several makers always produce satisfactory castings, but they are not always the lowest bidders, and much delay and unsatisfactory castings result. The same objectionable state of things exists under the present system in procuring machine tools. The poorest makers are the lowest bidders, and it is only after much controversy that a satisfactory machine is obtained. These remarks apply also to the purchase of tool steel. It is most economical to purchase the best steel for the purpose, without regard to price.

OFFICERS PERFORMING ORDNANCE DUTY.

The following are the officers of the Navy employed under this Bureau, with their respective stations and duties:

Name and station.	Duties.
BUREAU OF ORDNANCE.	
Lieut. Commander C. S. Sperry	Submarine boats and powder.
Lieut. Commander A. R. Couden	Armor and inspector of rapid-fire guns and ammunition at the works of the Driggs Ordnance Company, Philadelphia, Pa.
Lieut. Henry McCrea	Ships' allowances and Bureau library.
Lieut. A. A. Ackerman	Assistant to officer in charge of subjects pertaining to armor.
Ensign F. L. Chapin	Member of board on torpedoes and torpedo boats, and in in charge of all matters pertaining to torpedo outfits of vessels.
Ensign Joseph Strauss	In charge of development of engineering and construction of turret mounts.
Ensign Philip Andrews	All main-battery mounts other than those for turrets; secondary-battery mounts, ships' magazines, stowage and supply of ammunition.
Prof. P. R. Alger	Marine artillery construction and gun steel.
WASHINGTON NAVY-YARD.	
Commander Theo. F. Jewell	Superintendent naval gun factory.
Lieut. Commander E. H. C. Leutze	General duty in shops; installation of machinery, and all outside work.
Lieut. Herbert Winslow	Inspection of 10-inch mounts and ammunition hoists.
Lieut. Alfred Reynolds	Inspection of 8-inch guns and mounts.
Lieut. Albert Gleaves	Inspection of 6-inch guns and mounts; work for torpedoes, etc.
Lieut. W. L. Rodgers	Inspection of targets and ballistic armor plates; powder tanks, pattern loft, work for naval proving ground, and miscellaneous work.
Lieut. J. H. L. Holcombe	Inspection of secondary batteries, projectiles, and fuzes.
Lieut. J. H. Gibbons	Inspection of 6-inch guns and mounts, gunlocks, and primers.
Lieut. Stokely Morgan	Inspection of 10-inch guns, all electrical work, motors, etc.
Ensign A. L. Key	Inspection of 12 and 13-inch guns and mounts.
Ensign J. M. Poyer	Inspection of 4-inch guns and mounts.
Gunner William Walsh	In charge of packing and shipping manufactured articles and manufacture of miscellaneous articles.
Gunner F. C. Messenger	Instruction of class of seamen, and in charge of the naval magazine, Bellevue.

Name and station.	Duties.
NAVY-YARD, NORFOLK, VA.	
Lieut. Commander C. C. Todd	Inspector of ordnance.
Gunner John Gaskins	On duty in yard.
Gunner W. W. Carter	In charge of naval magazine, Craney Island.
NAVY-YARD, LEAGUE ISLAND, PA.	
Commander J. B. Coghlan	Inspector of ordnance; also in charge of the erection of buildings at the new naval magazine, Dover, N. J.
Gunner Cornelius Dugan	In charge of naval magazine, Dover, N. J.
Gunner C. H. Venable	In charge of naval magazine, Fort Mifflin.
NAVY-YARD, NEW YORK.	
Commander Horace Elmer	Inspector of ordnance.
Lieut. H. S. Waring	Assistant to inspector of ordnance.
Gunner Jos. Swift	In charge of naval magazine, Fort Wadsworth.
Gunner Jos. R. Grainger	On duty in yard.
Gunner James Hayes	Ordnance dock.
NAVY-YARD, BOSTON, MASS.	
Commander Geo. H. Wadleigh	Inspector of ordnance.
Gunner Geo. Fouse	In charge of naval magazine, Chelsea.
Gunner Saml. Cross	In charge of Niter Depot, Malden.
NAVY-YARD, PORTSMOUTH, N. H.	
Commander E. W. Watson	Inspector of ordnance.
Gunner Arthur A. Phelps	On duty in yard.
NAVY-YARD, MARE ISLAND, CAL.	
Commander C. E. Clark	Inspector of ordnance.
Gunner John G. Foster	Ordnance duty in yard.
Gunner Thomas M. Johnston	In charge of naval magazine.
TORPEDO STATION.	
Commander George A. Converse	Inspector of ordnance, in charge of station.
Lieut. Commander Charles Belknap	General charge of grounds, buildings, wharves, boats, etc.; supervision of enlisted men, including detail of seaman under instruction; in charge of manufacture of high explosives.
Lieut. Commander Duncan Kennedy	Charge of electrical laboratory, dynamo room and experimental electrical work. Instructor in electricity.
Lieut. G. F. W. Holman	Charge of torpedo assembling room; inspection of outfits, magazines and manufactured explosives; instructor in practical torpedo work.
Lieut. Roy C. Smith	Charge of preparations for general experiments; immediate charge of *Stiletto;* member of torpedo board.
Ensign E. E. Capehart	Assistant to officer in charge of grounds, etc. Instructor in diving.
Gunner M. W. Gilmartin	Assistant to inspector of outfits, magazines, etc.
NAVAL PROVING GROUND.	
Lieut. N. E. Mason	Inspector of ordnance. In charge of station.
Ensign R. D. Tisdale	Assistant inspector of ordnance. In charge of powder, and senior member board of inspection; observer at chronograph.
Ensign F. W. Jenkins	Assistant inspector of ordnance. In charge of all secondary battery work, ballistic tests of castings; observer at chronograph.
Ensign N. A. McCully	In charge of all projectiles, cases, etc., also explosion chamber; observer at chronograph.
Gunner P. C. Hanley	In charge of crane, handling guns and ordnance material. In charge of time book and general supervisor of labor around the batteries.
PRIVATE WORKS.	
Lieut. F. A. Wilner	Inspector of ordnance. In charge of the manufacture of armor at the works of the Carnegie Steel Company, Pittsburg, Pa.; also of armor-piercing shell at the works of the Sterling Steel Company, Demmler, Pa., and of rubber washers for armor bolts at the works of the B. F. Goodrich Company, Akron, Ohio.
Ensign John P. McGuinness	Assistant to above.
Ensign William L. Howard	Do.
Lieut. John Hubbard	Inspector of ordnance at the works of E. W. Bliss Company, Brooklyn, N. Y., of Whitehead torpedoes.
Lieut. H. M. Dombaugh	Assistant to above.
Lieut. Karl Rohrer	Inspector of ordnance. In charge of the manufacture of armor and gun steel at the works of the Bethlehem Iron Company, South Bethlehem, Pa.; also, of armor-piercing shell at the works of the Carpenter Steel Company, Reading, Pa.; and of steel common shell at the works of the Taylor Iron and Steel Company, High Bridge, N. J.
Ensign A. M. Beecher	Assistant to the above.
Lieut. J. H. Oliver	Member of board on torpedoes and torpedo boats; also inspector of ordnance in charge of the manufacture of the Howell torpedoes at the works of the Hotchkiss Ordnance Company, Providence, R. I.

Name and station.	Duties.
PRIVATE WORKS—continued.	
Lieut. C. W. Ruschenberger	Inspector of ordnance. In charge of the manufacture of gun steel and gun-carriage castings, as follows: Midvale Steel Company, Philadelphia, Pa.; Standard Steel Casting Company, Thurlow, Pa.; Penn Steel Casting and Machine Company, Chester, Pa.; Eureka Steel Casting Company, Chester, Pa.; Norristown Steel Company, Norristown, Pa.; B. Atha and Illingworth Company, Newark, N. J.
Ensign A. C. Dieffenbach	Inspector of ordnance. In charge of the manufacture of rapid-fire and machine guns and their ammunition, and of small arms and their ammunition, at the works of Pratt & Whitney; Pratt & Cady; Colts's Fire Arms Company, Hartford, Conn.; Union Metallic Cartridge Company, Bridgeport, Conn.; Winchester Repeating Arms Company, New Haven, Conn.; American Projectile Company, Lynn, Mass.; Simonds Rolling Machine Company, Fitchburg, Mass.

The following statements and reports are appended, viz:

A.—Statement showing the amount appropriated under each specific head of appropriation for the service of the Bureau of Ordnance during the fiscal year ending June 30, 1893, expenditures during the same period, and balance remaining on hand June 30, 1893.

B.—Statement of the number of days' labor and cost thereof from July 1, 1892, to June 30, 1893, at the respective navy-yards and stations, chargeable to the Bureau of Ordnance.

C.—Amounts expended during the fiscal year ending June 30, 1893, from the appropriations under the Bureau of Ordnance for civilians employed on clerical duty or in any other capacity than as ordinary mechanics and workingmen.

D.—Abstract of offers for furnishing supplies or services, and which were contracted for by the Bureau of Ordnance during the fiscal year ending June 30, 1893, and contracts awarded thereon.

E.—Detailed estimates for fiscal year ending June 30, 1895.

1. Annual report of the Superintendent Naval Gun Factory.
2. Annual report of the Inspector of Ordnance, Naval Torpedo Station.
3. Annual report of the operations of the Torpedo Board.
4. Report on the destruction of the gun-cotton factory at Newport by fire.
5. Annual report of the Inspector of Ordnance, Hartford, Conn.
6. Annual report of the Inspector of Ordnance, Naval Proving Ground.
7. Report on test of new .30-caliber Gatling gun.
8. Report of the Navy Small-Arms Board.
9. Report of the Board for the test of the *Vesuvius*.
10. Report of the Board for the test of the Sponsel gun.

Very respectfully,

W. T. SAMPSON,
Chief of Bureau of Ordnance.

The SECRETARY OF THE NAVY.

A.—Statement showing the amount appropriated under each specific head of appropriation for the service of the Bureau of Ordnance during the fiscal year ending June 30, 1893, expenditures during the same period, and balance remaining on hand June 30, 1893.

Appropriation.	Appropriated.	Expended.	Balance June 30, 1893.
Ordnance	$155,000.00	$115,625.20	$39,374.80
Repairs	30,000.00	29,274.59	725.41
Civil establishment	26,824.00	26,168.00	656.00
Contingent	8,000.00	5,946.18	2,053.82
Torpedo Station	60,000.00	54,422.64	5,577.36
Total	279,824.00	231,436.61	48,387.39

The amounts expended were—

For labor	$168,827.65
For material, etc	62,608.96

The balances remaining are all needed to meet outstanding obligations, except the balance under "Civil establishment."

The above statement does not embrace continuous appropriations for the new ships or for special objects.

B.—*Statement of the number of days' labor and cost thereof from July 1, 1892, to June 30, 1893, at the respective navy-yards and stations, chargeable to the Bureau of Ordnance.*

Navy-yard.	Number of days.	Cost.
Portsmouth	782	$1,899.83
Boston	1,315	3,208.60
New York	19,723	55,025.19
League Island	6,081	11,712.06
Washington	308,355	764,381.16
Norfolk	5,432	11,060.11
Pensacola	371	495.36
Mare Island	6,147	17,566.84
Key West	31	75.00
Naval-ordnance proving ground, Annapolis, Md	365	720.00
Naval proving ground, Indian Head, Md	34,446	50,187.47
Torpedo Station	19,982	48,790.30
Total	403,030	965,151.92

Includes labor on outfits for new ships and under appropriations for special objects.

C.—*Amounst expended during fiscal year ending June 30, 1893, from the appropriations under the Bureau of Ordnance for civilians employed on clerical duty or in any other capacity than as ordinary mechanics and workingmen.*

Navy-yard.	Rating.	Amount paid.
Portsmouth	1 writer (6 months)	$500.00
Boston	1 writer (6 months)	500.00
New York	1 clerk	1,400.00
	1 assistant expert in steel (Bethlehem Iron Works)	1,565.00
	1 writer (Pittsburg, Pa)	897.00
	1 copyist	166.26
Washington	1 clerk	1,600.00
	1 clerk	1,200.00
	1 writer	1,017.25
	1 writer	1,017.25
	1 telegraph operator and copyist	900.00
	1 copyist	720.00
	1 copyist	481.34
	1 draftsman	1,800.00
	1 draftsman	1,081.00
	1 draftsman	1,081.00
	1 draftsman	1,081.00
	1 assistant draftsman	772.00
	1 foreman	1,500.00
	1 foreman	1,500.00
	1 draftsman	1,412.04
	1 draftsman	1,247.06
	1 draftsman	1,097.80
	1 draftsman	944.87
	1 draftsman	1,043.43
	1 draftsman	1,069.70
	1 draftsman	1,072.76
	1 draftsman	1,020.01
	1 draftsman	958.56
	1 draftsman	905.95
	1 draftsman	973.65
	1 draftsman	966.07
	1 draftsman	892.39
	1 draftsman	159.00
	1 writer	1,252.00
	1 writer	1,220.00
	1 writer	1,034.68
	1 writer	838.48
	1 writer	901.12
	1 writer	1,093.82
	1 writer	939.75
	1 copyist	1,020.38
	1 copyist	951.92
	1 copyist	1,020.38
	1 copyist	176.04
	1 copyist	342.30
	1 stenographer and typewriter	734.38
	1 chemist	1,220.49
Norfolk	1 clerk	1,200.00
Mare Island	1 writer	1,017.25
Naval-ordnance proving ground	1 writer	1,017.25
Torpedo Station	1 chemist	2,055.55
	1 clerk	1,200.00
	1 draftsman	1,480.00
		55.258.18

D.—*Abstract of offers for furnishing supplies or services, and which were contracted for by the Bureau of Ordnance, during the fiscal year ending June 30, 1893, and contracts awarded thereon.*

Erection of telegraph line from navy-yard, Washington, to proving ground, Indian Head. (Advertisement dated September 14, 1892.)

Phillip F. Bashford	$5,890.00
Chas. S. Conner	*4,935.00
Chesapeake and Potomac Telephone Company	4,975.00

E.—*Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Ordnance, Navy Department.*

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
SALARIES.			
Chief clerk (Mar. 3, 1893; R. S., p. 70, sec. 416)	$1,800.00		
Draftsman (same acts)	1,800.00		
One assistant draftsman (July 11, 1888, vol. 25, p. 283, sec. 1; Mar. 3, 1893)	1,400.00		
One clerk of class three (Mar. 3, 1893; R. S., p. 27, sec. 167)	1,600.00		
One clerk of class two (same acts)	1,400.00		
One clerk of class one (same acts)	1,200.00		
One clerk (same acts)	1,000.00		
One copyist (same acts)	900.00		
One assistant messenger (same acts)	720.00		
One laborer (same acts)	660.00		
		$12,480.00	$12,480.00
ORDNANCE AND ORDNANCE STORES.			
For procuring, producing, preserving, and handling ordnance material; for the armament of ships; for fuel, and material and labor to be used in the general work of the ordnance department; for furniture at magazines, at the ordnance dock, New York, and at the naval ordnance proving ground (appropriated, act Mar. 3, 1893)	180,000.00		
Expenses of target practice (appropriated, act Mar. 3, 1893)	15,000.00		
Maintenance of new proving ground (appropriated, act Mar. 3, 1893)	5,000.00		
Modern battery for the Hartford (submitted)	150,000.00		
		350,000.00	200,000.00
REPAIRS, ORDNANCE.			
Necessary repairs to ordnance buildings, magazines, gun parks, boats, lighters, wharves, machinery, and other objects of the like character, including $1,650 for the addition of two rooms to the quarters of the inspector of ordnance at Fort Norfolk, Va. (appropriated act Mar. 3, 1893)	30,000.00		
Construction and extension of buildings at the naval magazine, Mare Island, Cal., to replace those destroyed by the explosion on June, 13, 1892 (submitted)	17,900.00		
		47,900.00	30,000.00
NOTE. The regular appropriation under this head is barely sufficient for routine repairs, and for the above item the amount asked for is required. (See recommendation on which the estimate is based. Appendix A.)			
CONTINGENT, ORDNANCE.			
For miscellaneous items, viz: Freight to foreign and home stations; advertising; cartage and express charges; repairs to fire engines, gas, and water pipes; gas and water tax at magazines; tolls, ferriage, foreign postage, and telegrams to and from the Bureau, and incidental expenses attending inspection of ordnance material (appropriated, act Mar. 3, 1893)		8,000.00	8,000.00
CIVIL ESTABLISHMENT, ORDNANCE.			
Navy yard, Portsmouth, N. H.:			
One writer, when required (appropriated, act Mar. 3, 1893)	500.00		
Navy yard, Boston, Mass.:			
One writer, when required (appropriated, act Mar. 3, 1893)	500.00		
Navy-yard, New York:			
One clerk (appropriated, act Mar. 3, 1893)	1,100.00		
Navy-yard, Washington, D. C.:			
One clerk (appropriated, act Mar. 3, 1893)	1,[illegible]		
One clerk (appropriated, act Mar. 3, 1893)			

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* Accepted. Contract dated Nov-

E.—*Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Ordnance, Navy Department*—Continued.

Detailed objects of expenditures and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
CIVIL ESTABLISHMENT, ORDNANCE—continued.			
Navy-yard, Washington, D. C.—Continued.			
Two writers, at $1,017.25 each (appropriated, act Mar. 3, 1893)	$2,034.50		
One draftsman (appropriated, act Mar. 3, 1893)	1,800.00		
Three draftsmen, at $1,081 each (appropriated, act Mar. 3, 1893)	3,243.00		
One assistant draftsman (appropriated, act Mar. 3, 1893)	772.00		
Two foremen, at $1,500 each (appropriated, act Mar. 3, 1893)	3,000.00		
Two copyists, at $720 each (appropriated, act Mar. 3, 1893)	1,440.00		
One telegraph operator and copyist (appropriated, act Mar. 3, 1893)	900.00		
Navy-yard, Norfolk, Va.:			
One clerk (appropriated, act Mar. 3, 1893)	1,200.00		
Navy-yard, Mare Island, Cal.:			
One writer (appropriated, act Mar. 3, 1893)	1,017.25		
Naval Proving ground:			
One writer (appropriated, act Mar. 3, 1893)	1,017.25		
Torpedo Station, Newport, R. I.:			
One chemist (appropriated, act Mar. 3, 1893)	2,500.00		
One clerk (appropriated, act Mar. 3, 1893)	1,200.00		
One draftsman (appropriated, act Mar. 3, 1893)	1,500.00	$26,824.00	$26,824.00
ARMING AND EQUIPPING NAVAL MILITIA.			
Arms and equipments connected therewith for naval militia of various States, under such regulations as the Secretary of the Navy may prescribe (appropriated, act Mar. 3, 1893)	....	25,000.00	25,000.00
GUN PLANT, NAVY-YARD, WASHINGTON.			
For erection of steam hammers, blast to furnace and forges, etc., in the new forge shop at the Washington navy-yard (mold loft building converted into forge shop, act of Mar. 3, 1893), (submitted)	6,000.00	....	....
For necessary machinery to equip the new machine shop at the Washington navy-yard (old forge shop reconstructed, act of Mar. 3, 1893), and for additional boiler power (submitted)	111,000.00	117,000.00	....
TORPEDO STATION.			
For labor, material, freight and express charges; general care of and repairs to grounds, buildings, and wharves; boats; instruction instruments; tools; furniture; experiments and general torpedo outfits, (appropriated act Mar. 3, 1893)	60,000.00		
Replacing gun-cotton factory destroyed by fire July 3, 1893 (submitted)	11,077.00	71,077.00	60,000.00
INCREASE OF THE NAVY, ARMOR AND ARMAMENT.			
Towards the armament and armor, of domestic manufacture, for the vessels authorized by the act of Aug. 3, 1886; of the vessels authorized by the act approved Sept. 7, 1888; of the vessels authorized by the act approved Mar. 2, 1889; of those authorized by the act of June 30, 1890; of the one authorized by the act of Mar. 2, 1891; of these authorized by the act of July 19, 1892, and of the vessels authorized by the act of Mar. 3, 1893 (appropriated, act Mar. 3, 1893)	....	6,500,000.00	....

NOTE.—During the twelve months ending September 30, 1893, 5,691 tons of armor have been delivered, and at this rate of delivery the remainder of the armor still due on existing contracts (12,415 tons) will all be delivered by June 30, 1895. There was no appropriation under this head for the present fiscal year, and the amount above estimated will be required, in addition to the balance on hand from previous appropriations, to meet expenditures to the close of the fiscal year 1894-'95.

On July 1, 1893, the amount available was $7,656,256, and for armor alone the following amounts will be expended to June 30, 1895:

To the end of the present fiscal year	$4,026,024
To the end of the fiscal year 1894-'95	5,314,777
Total	9,340,801

Respectfully submitted.

W. T. SAMPSON,
Chief of Bureau of Ordnance.

AUGUST 15, 1893.

APPENDIX A.

OFFICE OF INSPECTOR OF ORDNANCE,
Navy-yard, Mare Island, Cal., July 8, 1893.

SIR: (1) I have the honor to submit herewith an estimate of the probable amount of money that will be required in the ordnance department at this yard for the fiscal year 1894-'95.

(2) The filling house should be built as soon as funds can be obtained, as ammunition is now prepared in the watch house on the wharf, which is closely approached by passing steamers. The estimate is for a building with brick walls and metal roof, but the board, of which Capt. E. C. Matthews was the senior member, also considered and may have submitted to the Bureau the plans of an iron building sheathed with wood inside, which would cost considerably less. A wooden building was regarded as out of the question on account of the danger from grass fires during the dry season.

(3) The gun-cotton magazine is required because part of the gun cotton now on hand has to be stored in one of the powder magazines contrary to regulations. The estimate is for a brick building with metal roof, with ventilated air space under it to keep down the temperature. The gun-cotton magazine is the bombproof at the redoubt, and if this is considered the best type, and the new is to be excavated, the estimate should be at least doubled.

(4) The building in place of the wooden filling house ruined by the explosion, to be torn down when more storage room is obtained, and the extension asked for to the new building, now nearly completed, on the site of the brick filling house, are needed for the safe and proper handling of ammunition and for the storage of rapid fire ammunition. Room is also required to allow repairs to be made to the shell-houses, the walls of No. 1 having been injured, the floor timbers of No. 2 being rotted, and the floors of both being worn down so far that the nails are showing in places.

(5) The paint and tool house is required by regulation and should be built of brick, with metal roof, so as to avoid the risks due to the presence of wooden buildings in the inclosure.

(6) The house for watchman is asked for because two families, those of the men who have been especially commended for bravery and good conduct, are crowded into quarters only large enough for one. There being no way of dividing the lower floor, one family has to live in rooms that are under the pitch of the roof, and in summer the heat of the sun and the kitchen fire make them almost uninhabitable. The cost of a dwelling on the proposed site to the northward of the inclosure could well be afforded if for no other purpose than to have the grounds and approaches to No. 2 magazine and the beach in front of it, where fishermen and hunters can now land, overlooked. The watchman is obliged to walk 200 yards from the watchhouse to bring No. 2 magazine into view.

* * * * * * *

	Labor.	Material.	Total.
Filling house, 24 by 20 feet; height, 12 feet; walls, 17 inches thick; metal roof	$1,700.00	$1,100.00	$2,800.00
Gun-cotton magazine, 30 by 24 feet; height, 14 feet; walls, 17 inches thick; metal roof	2,000.00	1,400.00	3,400.00
Building in place of wooden filling house, 50 by 30 feet; height, 14 feet; walls, 17 inches thick; metal roof	2,600.00	1,800.00	4,400.00
Extension of building nearly completed, 60 by 30 feet; height, 14 feet; walls, 17 inches thick; metal roof	2,500.00	1,700.00	4,200.00
Paint and tool house, 12 by 12 feet; height, 10 feet; walls, 13 inches thick; metal roof	550.00	350.00	900.00
Watchman's house, 35 by 24 feet; wood, slate roof	1,200.00	1,000.00	2,200.00
Total	10,550.00	7,350.00	17,900.00

* * * * * * *

Very respectfully,

C. E. CLARK,
Commander, U. S. N., Inspector of Ordnance.

The COMMANDANT, NAVY YARD, MARE ISLAND, Cal.

No. 1.

ORDNANCE OFFICE,
UNITED STATES NAVY-YARD,
Washington, D. C., September 25, 1893.

SIR: I have the honor to report as follows concerning the operations of the naval gun factory during the past year:

GUNS.

Thirteen-inch B. L. rifles.—At the date of the last report, September 13, 1892, one set of forgings had been received and the gun assembled. Since that date seven complete sets of forgings and portions of the remaining four sets have been received.

Two guns are now completed and ready for their breech mechanisms; three others are assembled and are in the last stages of manufacture, and the jacket and tube of two others have been assembled.

The breech mechanisms for these guns have been designed and that for one gun is approaching completion.

Twelve-inch B. L. rifles.—At the date of last report four guns were completed. At this date eight—the whole number authorized—have been finished.

Of these guns two are on board the *Monterey*, one is at the proving ground, and one at the Worlds Columbian Exposition at Chicago. The remaining four are still at the factory ready for their breech mechanisms.

During the past year the time required to manufacture a gun of this caliber, from the rough boring of the tube to the rifling and lapping of the gun, has been reduced from ten months to six and one-half months, with a consequent reduction in the cost of labor of some 32 per cent. This improvement in manufacture is due in a large measure to the new and improved gun lathes, in which turning and boring is done at the same time. It is proper to add that due credit should be given, also, to the efficient superintendence of the quarterman of the north gun shop, Mr. Thomas M. Hayes.

Ten-inch B. L. rifles.—At the date of the last report twenty one of this caliber had been completed. The remaining four have since been completed, making twenty-five in all, the full number ordered.

Two of these guns have been fitted with a new breech mechanism, which is now undergoing some modifications that have been found necessary on trial. A still further modification is in progress by which the weight of the mechanism will be materially reduced without diminishing its strength.

Four of these guns for the *Terror* have been fitted with breech mechanisms during the year.

Eight-inch B. L. rifles.—Twenty-one guns of this caliber were finished last year. During the year twelve have been completed, making thirty-three guns finished. Of the remaining eighteen ordered, four are nearly completed, nine are assembled, and five are nearly ready for assembling.

Of the twelve guns finished during the year, ten are not yet fitted with breech mechanisms.

The forgings for a nickel-steel gun of this caliber, of novel design, have been machined and are ready for assembling. The furnace for assembling this gun, designed by Mr. Sellers, of Philadelphia, has been received and is now being erected.

Six-inch B. L rifles.—During the year, two guns of 35 calibers have been completed.

Six sets of forgings for this caliber have been received. One gun is well advanced in manufacture, and the tubes of the other five have been jacketed. These guns are to be fitted as rapid-fire guns. The first one will receive a breech mechanism designed by Lieut. F. F. Fletchêr, U. S. Navy, and another with a mechanism of the Dashiell type. The former is well in hand, while the drawings of the latter have been completed.

Five-inch B. L. rifles.—The total number of 5-inch guns of 40 calibers to be manufactured for vessels authorized is 66. Of this number six had been completed at the date of last report. Twenty-five others have been completed during the year, and at this date there are five nearly completed and eleven assembled. Seven sets of forgings in addition have been received and are at hand, and twelve sets of forgings are to be received.

Four-inch B. L. rifles.—At the date of the last report, twelve had been completed, four being of the ordinary type, two fitted with the Driggs-Schroeder breech mechanism, and six with the Dashiell mechanism. During the year thirty-eight more have been completed and seventeen others are assembled and approaching completion.

The 4-inch and 5-inch guns manufactured during the year have all been fitted with the Dashiell breech mechanism. The later ones have had applied to them a new form of tray latch, the design of Ensign J. M. Poyer, U. S. Navy, and Master Mechanic Wm. Hough, which is a marked improvement on the former one.

The following gives, in a condensed form, the progress on gun work during the year:

Steel B. L. rifles manufactured and in progress September 15, 1893.

	13-inch.	12-inch.	10-inch.	8-inch.	6-inch.	5-inch.	4-inch.
Completed September 15, 1892	0	4	21	21	127	0	12
Completed September 15, 1893	2	8	25	33	129	31	50
Nearly completed	3	0	0	4	7	5	7
Assembled and partly completed	2	0	0	9	5	11	10
In hand	1	0	0	5	0	7	0
Total	8	8	25	51	141	54	67

GUN MOUNTS.

Thirteen-inch turret mounts.—At the date of the last report, a 13-inch mount had been designed and patterns for the castings were in progress. This mount is similar to the 12-inch, Mark II, mounts of the *Texas*, requiring two gun-working motors. But one mount of this type has been authorized, and this now is nearly completed. This mount is intended for permanent use at the proving ground.

A new design for a new 13-inch mount has been made, which is similar to the 12-inch mounts of the *Monterey*, the patterns for which are completed, and twelve sets of castings have been ordered.

Twelve-inch turret mounts.—At the date of last report, the mounts (Mark I) had been completed and sent to the *Monterey*, and four mounts of the same type were ordered for the *Puritan*. One of these has been completed and is now undergoing trial at the provin
Two others are practically completed and a ng
the erecting shop. The fourth is well und

Castings have been received for one o
for the *Texas*, and considerable progress
them. The smaller parts of both moun

Ten-inch turret mounts.—Two of the ten-inch mounts for the *Maine*, have been completed and tested. The third is now at the proving ground, a modification of the holding-out device having been made in it. The fourth mount for this vessel is in hand. These mounts are of the same type (Mark III) as the twelve-inch mounts of the *Texas*.

Two of the 4 mounts for the *Amphitrite* (Mark II) are practically completed and are now being set up in the erecting shop. The other 2 are in hand, as are the 4 mounts of the same type for the *Monadnock*.

Eight-inch turret mounts.—The 4 mounts which were in process of manufacture a year ago for the *New York* have been completed. Four others for the *Olympia* are now building.

Six-inch center-pivot mounts.—Nine 6-inch center-pivot carriages have been completed during the year and 4 others are nearly completed. There remain 9 to be manufactured to complete the 127 at present ordered.

Five-inch rapid-fire mounts.—The total number of these mounts at present ordered is 66. Eleven mounts were completed last year, 19 have been completed during the year. The castings for the remainder are now being delivered and work has begun on them.

Four-inch rapid-fire mounts.—Twenty-five 4-inch mounts have been completed during the year, being the balance of the 40 for which castings were first ordered. The castings for 27 others are now being delivered, and on 11 of these some progress has been made.

Four of these mounts have been fitted with shields. During the year a new type of 4-inch mount, embodying radical changes in the elevating and training gear, has been built and tested very satisfactorily. Eight mounts of this type, designated Mark III, have been ordered for the *Essex*, and are in progress.

Experiments have resulted in the adoption of a clutch on the training gear of the 4-inch and 5-inch mounts, by which the training gear can be thrown in or out of action by a slight movement of a lever.

A flexible shaft and one with a universal joint for the elevating gear have been experimented with, but as yet satisfactory results have not been obtained.

An experimental telescope sight is being fitted to a mount of Mark III type.

The 4-inch twin mount, provided with an electric motor for training, the work on which has been delayed on account of the pressure of other work, is now completed.

While the mount shops have so far been able to keep pace with the progress on the ships in providing mounts as fast as they were required, it is recognized that in the course of the next few months the demand will greatly exceed the capacity of the shops. As all the machines are now worked to their utmost, there would seem to be no remedy for this condition of affairs unless considerable additions be made to the number of machine tools.

Gun carriages and mounts completed and in progress September 15, 1893.

	13-inch.	12 inch.	10-inch.	8-inch.	8-inch C. P.	6-inch.	5-inch.	4-inch.
Completed Sept. 15, 1892	....	2	8	....	18	104	11	15
Completed Sept. 15, 1893	....	3	10	4	18	114	30	40
Nearly completed	1	2	3	....	....	4	....	8
Partly completed	....	3	7	4	....	9	36	11
Total	1	8	20	8	18	127	66	59

SECONDARY-BATTERY MOUNTS.

Thirty-seven 6-pounder cage stands and fifty-one 6-pounder hydraulic recoil mounts; sixteen 3-pounder hydraulic recoil mounts; sixty-four 1-pounder cage stands, ninety-four 1-pounder deck circles, and thirty-three 1-pounder recoil mounts; 21 top-shelf mounts and 8 rail sockets have been completed for issue during the year.

PROJECTILES.

The following numbers of projectiles have been turned, banded, and prepared for issue:

12-inch armor-piercing shells	15
10-inch armor-piercing shells	554
8-inch armor-piercing shells	822
6-inch armor-piercing shells	1,209
4-inch experimental armor-piercing shells	3
6-inch forged steel shells	1,528
5-inch forged steel shells	3,219
4-inch forged steel shells	1,298
13-inch cast-iron shells	3
12-inch cast-iron shells	55
8-inch cast-iron shells	65
6-inch cast-iron shells	187
5-inch cast-iron shells	1,265
4-inch cast-iron shells	585

The following have been cast in the foundry:

13-inch iron shells	52
8-inch iron shells	375
5-inch iron shells	327
4-inch iron shells	318

AMMUNITION HOISTS.

Two 8-inch ammunition hoists for the turret mounts, operated by electric motor, two 8-inch hoists for broadside guns, operated by hand or steam power, and two 4-inch hoists have been made and shipped to the *New York*. Two 8-inch hoists for turrets, one 8-inch hoist, broadside, and two 4-inch hoists are in progress for the *Columbia*.

Designs have been made for 5-inch and 6-inch rapid-fire ammunition hoists and work on them will soon begin. A 5-inch hoist for the *Montgomery*, designed by Lieut. F. J. Drake, is being made.

The ammunition hoists and transporting arrangements for the turrets of the *Maine*, *Texas*, *Amphitrite*, *Monadnock*, and *Puritan* are in different stages of advancement, some in the shops and some having patterns made for castings.

IMPROVEMENTS.

The breech mechanism shop, the improvement of which was begun last year, has been completed, and most of the new tools have been installed. The removal of the smaller guns to this shop for sighting and fitting of the breech mechanisms has to some extent relieved the very crowded condition of the gun shop.

The conversion of the mold loft into a forge shop, for which an appropriation was included in the last appropriation bill, has been begun. When this shop is ready for occupancy a much-needed expansion of the gun carriage and projectile shops can be effected.

An appropriation has also been made for a new timber shed of corrugated iron.

One corner of storehouse No. 10 has been fitted with racks for the storage of steel.

In view of the already great demand on the main boilers in the quadrangle, the completion of the new forge shop will necessitate more boiler power. The most feasible, and, in the end, most economical plan for obtaining the additional boiler power necessary is to extend the present boiler house near the pattern shop and to place in it four new boilers. The two boilers now in that location are very old and in such bad condition as to be dangerous.

MISCELLANEOUS.

There have been manufactured to date the following number of cylindrical powder tanks:

5-inch	445
6-inch	10,564
8-inch	2,330
10-inch	1,444
12-inch	480
13-inch	44

Two thousand five hundred Schenkl percussion fuses and 2,700 base fuses have been made.

The necessary supply of ammunition boxes, gun implements, cartridge and burster bags, gun covers, single sticks, and cutlass scabbards have been made.

INSTRUCTION OF SEAMEN.

During the past year seventy-four seamen have been detailed for instruction in ordnance; of this number thirty-nine have completed the course for seamen gunners and have been transferred to the torpedo station for further instruction, eight were transferred to the general service, two were discharged, one deserted, and one died. Twenty-three remain under instruction at this time.

It is a pleasure to say that as a rule these men show remarkable interest in the work and are assiduous and attentive to their duties.

Lieut. B. W. Hodges, attached to the receiving ship *Dale*, is in charge of the instruction of seamen.

The following officers are employed on ordnance duty:

Lieut. Commander E. H. C. Leutze: General duty in shops; installation of machinery, and all outside work.
Lieut. Herbert Winslow: 10-inch mounts; ammunition hoists.
Lieut. Alfred Reynolds: 8-inch guns and mounts.
Lieut. Albert Gleaves: 6-inch guns and mounts; torpedoes, etc.
Lieut. W. L. Rodgers: Targets and armor; powder tanks; pattern loft; work for Indian Head; miscellaneous work.
Lieut. J. H. L. Holcombe: Secondary batteries; projectiles and fuses.
Lieut. J. H. Gibbons: 5-inch guns and mounts; locks and primers.
Lieut. Stokeley Morgan: 10-inch guns; all electrical work, motors, etc.
Ensign A. L. Key: 12-inch and 13-inch guns and mounts.
Ensign J. M. Poyer: 4-inch guns and mounts.
Gunner William Walsh: In charge of packing and shipping manufactured articles, and manufacture of miscellaneous articles.

These officers have discharged their duties, which have required their constant attention, with commendable zeal and ability.

Especial mention should be made of the services of Lieutenant-Commander Leutze, the senior assistant, whose attendance in the shops has been almost continuous during the working hours.

The following officers have been detached from ordnance duty during the year: Lieut. Commanders E. C. Pendleton and C. O. Allibone; Lieuts. F. H. Crosby, F. E. Greene, D. L. Wilson, and C. J. Badger; Gunner J. J. Walsh, U. S. Navy, and Lieut. John Conklin, jr., U. S. Army.

OFFICE.

The methods of keeping the records of the office have been changed, and since January 1 the plan adopted in the Bureau of Ordnance has been in use.

Proper credit is due to Mr. Thad. K. Sailer, chief clerk, for the efficient organization of the clerical force, by which the work of the office is carried on in a very satisfactory manner.

Very respectfully,

THEO. F. JEWELL,
Commander, U. S. Navy, Superintendent Naval Gun Factory.

The COMMANDANT NAVY-YARD,
Washington, D. C.

No. 2.

NAVAL TORPEDO STATION,
Newport, R. I., September 12, 1893.

SIR: I have the honor to submit the following report regarding this station and the work completed and in progress during the past year:

On the 2d of January last, I relieved Commander T. F. Jewell as inspector in charge.

During the year the following changes have occurred in the personnel:

Detached.—Lieut. T. C. McLean, February 28, 1893; Lieut. W. A. Marshall, April 30, 1893; Lieut. Commander H. W. Lyon, March 22, 1893; Lieut. M. E. Hall, June 5, 1893; and Acting Gunner H. A. Eilers, June 14, 1893. Prof. C. E. Munroe, chemist to torpedo corps, resigned November 26, 1892.

Reported for duty.—Acting Gunner H. A. Eilers, March 20, 1893; Lieut. G. F. W. Holman, March 27, 1893; Ensign E. E. Capehart, June 15, 1893; Lieut. Duncan Kennedy, June 20, 1893; and Gunner M. W. Gilmartin, July 25, 1893. Mr. H. F. Brown was appointed chemist at the torpedo station December 3, 1892, and reported for duty February 1, 1893.

The present assignment of duty is as follows:

Commander G. A. Converse: Inspector of ordnance, in charge of station.
Lieut. Commander Charles Belknap: General charge of grounds, buildings, wharves, boats, etc.; supervision of enlisted men, including detail of seamen under instruction; in charge of manufacture of high explosives.
Lieut. Commander Duncan Kennedy: Charge of electrical laboratory, dynamo-room, and experimental electrical work; instructor in electricity.
Lieut. G. F. W. Holman: Charge of torpedo assembling room; inspector of outfits, magazines, and manufactured explosives; instructor in practical torpedo work.
Lieut. Roy C. Smith: Charge of preparations for general experiments; immediate charge of *Stiletto;* member of torpedo board.
Ensign E. E. Capehart: Assistant to officer in charge of grounds, etc.; instructor in diving.
Gunner M. W. Gilmartin: Assistant to inspector of outfits, magazines, etc.
Surg. P. Fitzsimons: Medical officer.
Passed Assistant Paymaster C. S. Williams: Paymaster: General storekeeper and purchasing pay officer.
H. F. Brown: Chemist at torpedo station.
Karl Hedburg: Draftsman.

BUILDINGS, WHARVES, BOATS, PLANT, ETC.

Buildings.—The buildings generally are in a fair condition and have required little beyond the usual repairs during the past year. With the exception of painting it is not anticipated that they will require any extensive outlay for labor or material for some time to come.

The chemical laboratory has been remodeled, repaired, and painted. To better adapt this building to the present requirements of the station, the large room formerly used for lecture purposes has been subdivided, thus providing small rooms in which several investigations can be carried on simultaneously without interference.

The present location of the paint shop in the end of storehouse No. 2 is objectionable as being a source of danger to the surrounding buildings. It is in contemplation to erect a shed, suitable for the purposes of a paint shop, near the sea wall, about midway between the machine shop and the *Fortune's* dock. This change will also give additional storeroom in the present building, which is greatly needed.

Wharves.—The principal wharf requires repairing at the north end where the crane is located. Several piles should be replaced, and the planking needs thorough overhauling and some of it must be renewed in the near future. The work will be taken in hand as soon as circumstances permit.

The condition of the other wharves and the floats is good.

Marine railways.—When the *Cushing* was last hauled out at this station great difficulty was experienced on account of her increased draft forward, due to her armament having been placed on board. It is now possible to haul her up only at spring tides, and even then the operation requires the most careful management. To get 4 feet more water at the foot of the ways it is necessary to extend them 100 feet, the angle of rise being 1 foot in 25. The material has been procured for this extension and the work will be commenced immediately. When completed it will be possible to haul the *Cushing* out at any high tide, a great desideratum in cases of emergency.

The smaller ways are in excellent condition and are very efficient.

Tug Fortune.—This vessel is in fair condition, her boilers and engines having been thoroughly overhauled during the winter. Advantage was taken of her presence in New York last April to have her docked, the bottom cleaned and painted, and rudder post straightened. The hull is sound, and the boilers with proper care will be serviceable for another year.

In addition to her services at this station, the *Fortune* has been employed to transport gun cotton and loaded projectiles for the *Vesuvius* to New York; participated in the naval parade in April last, and has assisted in the trial trips of the *New York*, *Machias*, and *Castine*.

Ferry launches.—The *Billow* received considerable hard usage during the ice blockade last winter, but has since been overhauled and is now in fair condition. The *Wave* is undergoing repairs. The hull is in excellent condition, but the engines need general repairs and readjustment. The boiler is poor, but it is expected that the repairs being made will render it serviceable for another year, when it should be replaced.

Other launches.—The *Ripple* has been extensively repaired, and having received a new boiler is now in an excellent condition. This boat is most useful for transferring freight and as a tender for the diver's launch.

The *Spray's* boiler has been condemned as unfit for further use. A new boiler has been ordered, and its early delivery is expected. This boat has long been used for instruction of officers and men in handling the spar torpedo; and although the hull has been frequently injured, it has been thoroughly repaired, and is believed will meet all probable requirements for some time.

The other boats belonging to the station are in fair condition.

Plant.—The machinery, tools, and general plant used in the manufacture of torpedoes and torpedo appliances are in good condition. Some additional machinery, comparatively inexpensive, is desirable to enable the station to economically manufacture certain articles forming a part of the outfits which accompany automobile torpedoes.

The main boilers are not in a satisfactory condition, and need a thorough overhauling and retubing. The tubes necessary for this purpose were ordered some time ago, but owing to the temporary suspension of work at the mills where they were to be manufactured, have not yet been delivered.

Instruments.—The electrical, chemical, and other instruments and apparatus used for investigation, experiment, and instruction, are in good condition. No important additions have been made during the past year, as those on hand have been found adequate to the requirements of the station.

Lighting System.—The dynamos and engines used for lighting purposes are in good condition, though an obselete and uneconomical type. The underground conductors frequently give trouble, from injury to the insulation, and are not of sufficient capacity. New conductors will soon be an absolute necessity, and they should be laid in suitable conduits which will permit examination of their condition and the replacing of such as may be found defective, without the great expenditure of time and labor now necessary.

Water system.—The water main connecting the island with the town having become leaky, a new one of 3-inch galvanized iron pipe was laid last October. Owing to the unusual severity of the winter, the water froze in the main, in the early part of January last, and for upwards ot three weeks the station was unable to obtain any supply through the line. Examination showed that the pipe had been split in such a large number of places as to render it useless. It was, therefore, taken up, and recourse was had to the old line which has been in use since. A 2-inch extra-heavy pipe is now being laid, and the one at present in use will be thoroughly repaired, so that it also will be available in emergencies.

TORPEDO BOATS.

Stiletto.—The *Stiletto* being fitted with bow and central pivot tubes of the Howell type, has been used principally in connection with the test of that torpedo. These trials are now conducted at the Hotchkiss Ordnance Company's trial station, near Tiverton, R. I., and the *Stiletto* furnishes a ready means of communication; carrying the officers under instruction, and members of the torpedo board, who are conducting the official tests, to and fro; the time occupied in making the trip being about 52 minutes. The tests necessary to demonstrate the ability of the torpedo when fired from a vessel moving at speed, to fulfill the contract requirements, are to be conducted from the *Stiletto*, and in fact had already commenced when an unfortunate accident to the low pressure cylinder of the boat caused them to be suspended temporarily. As soon as the necessary repairs, now well advanced, can be completed, the tests will be resumed.

During the naval parade in New York harbor last spring the *Stiletto* performed efficient service with the patrol squadron.

In connection with the experiments being carried on with a view of determining the best shades and color for torpedo boats maneuvering at night under varying conditions of weather and light, the *Stiletto* has been painted a dark olive green similar to the color much used abroad. For comparative tests it is proposed to retain this color, while the shade of other boats employed in the experiments will be slightly varied.

Cushing.—The *Cushing* has been attached to the station for experimental work since the conclusion of the naval review. She is completely fitted with Whitehead torpedoes and apparatus, and carries out practice with them here and in Noyack Bay, Long Island, for the purpose of demonstrating the adequacy of the fittings and the appropriateness of the drill devised for their operation. The value of the work done by the *Cushing* can not be overestimated in the present development of torpedoes. It is hoped to send outfits into the service which have been proved in actual use, and the *Cushing* furnishes the most important means to that end.

Advantage is also taken of her presence to determine by experiment the color best suited for torpedo boats. The color, originally the same as that of the *Stiletto*, has been somewhat lightened from time to time, while that of the latter boat remains unchanged for purposes of comparison.

MANUFACTURE OF TORPEDO SUPPLIES.

Spar torpedo outfits.—During the past year a complete outfit has been supplied to the *Raleigh*, and partial outfits have been sent to the *Charleston*, *Newark*, and *Fern*, and also to the naval reserve of the State of New York and the Columbian Exposition.

Complete outfits for the *Detroit*, *Montgomery*, *Marblehead*, *Castine*, and *Machias* have been prepared and are held in readiness for immediate shipment.

One complete outfit, unassigned, and two partial outfits, are in store; and there are also a large number of service torpedoes, exercise torpedoes, and other articles of similar nature on hand to supply deficiencies in original outfits, caused by the periodical expenditures in practice and for purposes of experiment.

Automobile torpedo outfits.—A complete set of punches for cutting the leather washers used for packing joints and a set of dies for forming the cups used for packing pistons of the Whitehead torpedo have been made, and the articles themselves can now be supplied as rapidly as circumstances require.

Two "depth registers" have been finished and are ready for issue.

Two "torpedo directors" of improved design have been completed, and one is now being installed on the *Cushing* for practical tests of its efficiency.

Twin-tube turn-table mount.—The turn-table mount of the twin-tubes of the *Cushing* having proved unsatisfactory, a new one, designed by Lieut. F. F. Fletcher, has been completed at this station and is now being placed on board. The defects which were found to exist in the old design have been entirely avoided in the new, and it is confidently believed that the latter will be found to be very efficient.

Gun Cotton.—From September 1, 1892, to the date of the destruction of the gun-cotton factory by fire, 18,533 pounds of gun cotton were manufactured and 5,088 pounds were reworked; a large part of the latter being refuse arising from work done at this station, notably the filling of the *Vesuvius* shells.

Detonators.—Seven hundred and seventy detonators have been finished and 235 more are in various stages of completion.

Position Signals.—Upwards of 400 cans, each containing 10 ounces of calcium phosphide have been prepared, and are to be used in connection with the trials of the Howell torpedo, for the purpose of locating its position at the end of its run.

Vesuvius projectiles.—Thirty sub-caliber shells for the pneumatic guns of the *Vesuvius* were received and loaded according to instructions from the Bureau—25 being filled with charges of wet gun-cotton (each charge averaging 206½ pounds,) and the remaining five with 10 pounds black powder, and discs of wood. Five of the shells filled with gun-cotton are now at this station; all others were sent to the *Vesuvius* at New York.

PROGRESS OF EXPERIMENTAL WORK.

During the past year much experimental work has been done tending to the development of torpedoes and their accessories, defense nets, the use of search lights, etc.

Automobile torpedoes.—Many changes have been made in the Hall torpedo, and the experiments have been continued from time to time under the immediate supervision of the inventor. As a result of these changes the performance of the torpedo is much more satisfactory than heretofore, and continued improvement is noted in the trials now being made daily.

Firing cage for underwater discharge.—In order to determine the relative advantages of the underwater and overwater discharge of automobile torpedoes when fired from a fixed platform, a firing cage, similar to the one used at the Whitehead establishment in Fiume, has been borrowed from the E. W. Bliss Company. Arrangements have been made by which this cage will be suitably installed in the northern end of the boathouse near the principal dock. An unobstructed range of 1,300 yards, and having a minimum depth of 18 feet, is thus afforded. It is proposed to locate the experimental mount for overwater discharge, already belonging to this station, in the boathouse very nearly over the submerged cage, thus giving an excellent opportunity to determine by practice the merits of each.

Torpedo directors.—It is proposed to manufacture the torpedo directors to be furnished to our new vessels at this station. For the purpose of determining the most suitable type, the Bureau early in the spring placed an order for one set of directors with Elliott Brothers, well-known instrument makers of London. These, however, have not yet been received. One set (for fixed and movable tubes) has been completed at this station from designs which are modifications of those used abroad. The principle of all directors is the same—one diameter of a graduated arc is kept parallel to the torpedo tube; a torpedo-directing bar, pivoted at the center of the arc, is set parallel with the estimated course of the torpedo in the water; another bar on the same pivot is set parallel with the estimated course of the enemy; a sighting bar, pivoted at the other end of the torpedo direction bar, intercepts on the two bars distances proportional to the speeds of the enemy and the torpedo, respectively. On the principle of similar triangles, if the torpedo is discharged when the sights come on, it will reach its mark, provided the estimations have been correctly made.

Defense nets.—The *Fortune* has been specially fitted to test the torpedo-defense net booms provisionally adopted by the Bureau, and the method of attaching the net, rigging out, and stowing. It is assumed that the heels of the booms will be carried about four feet above the water in all types of vessels, except monitors, and that the eyes, or ringbolts, to which the lifts are attached, will be at least six feet above the heels. In special cases of vessels having low freeboard the heels of booms can be lowered a foot or two, while the other conditions remain practically the same. To secure these heights aboard the *Fortune* it was necessary to build up the rail abreast the heels of the booms with stout wooden trusses securely bolted and guyed. Two booms only have been fitted, between which are suspended three sections of the net, with total dimensions of 45 by 20 feet. The whole defense can be brailed up and rigged in and out with a steam winch with which the *Fortune* is provided. The fittings seem adequate at present, though no trials have yet been made underway. The experiments in this direction will be continued as soon as the *Fortune*, which is now absent on duty connected with the speed trials of one of the new vessels, returns to this station.

In regard to the nets themselves, three varieties have been received for test. One is the well-known Bullivant, and two have been manufactured by the Midgley Wire Belt Company, of Beaver Falls, Pa. These last two are alike in type, but differ in material and size of wire. The heavier one is of nickel steel, and the lighter of steel music wire. On the conclusion of the experiments with the fittings the nets will be removed from the *Fortune*, suspended in water from a heavy spar, and fired at with projectiles from the *Destroyer's* submarine gun. The charges of powder, small at first, will be gradually increased until each net has been penetrated, thus giving a comparison of the resisting power of the three varieties. It was hoped from previous tests that the nickel-steel net would not be subject to rust. Experiments are now in progress to determine if this can be realized. While it is too early to make a prediction, it seems probable that the material is not fully up to expectations.

Naval-defense mine.—Proposed modifications of the present defense mine have received consideration, but the details of suggested changes have not as yet been fully worked out. A material reduction in the size of the explosive charge, and a change in the form of case, which will permit considerable decrease in its weight, and that of the anchor and all other accessories, are contemplated.

Detention of torpedo boats.—In connection with the experiments being made under the direction of the Torpedo Board for the purpose of determining the color best adapted to torpedo boats, the *Cushing* has been directed, whenever practicable, to time her return to this station from the testing ground at Noyack Bay, so as to enter the harbor after dark. The search light in the tower of the electrical laboratory has been used to sweep the harbor entrance, and the lookouts have usually occupied the same position. The defense has been handicapped to a certain extent in this way; part of the beam of light is always intercepted by the window casings and sashes, which, on account of the construction of the tower, can not be prevented, and the lookouts are in consequence blinded by the glare made in the tower. Also, on account of the height of the light, the zone swept does not have the depth that is desirable.

To remedy these defects a new shelter for the large projector, which formerly stood on the pier leading to the dock in the inner harbor, has been constructed on the most western salient of the old fort. This position commands all the entrances to Newport and the whole outer harbor. The doors of the shelter are arranged to open entirely back on the north, west, and south sides and leave no obstruction whatever to the arc of train, which is 220°. The projector used is 36 inches in diameter, and is most powerful. Experiments are being continued whenever opportunity offers.

Submarine gun and projectiles.—The *Destroyer* arrived at this station in August, having been towed from New York. She will be used in obtaining further data as to the accuracy of the submarine gun, and also in testing the relative strengths of the defense nets. Six projectiles, of which two are automatic, are on board, remaining from former tests. The four nonautomatic ones will be used in connection with the test of the nets. Five other projectiles of stronger form have been reported as finished and ready for shipment at Rowland's machine shop, New Haven, Conn. These projectiles are daily expected.

In connection with the tests of these submarine projectiles, a large balancing tank has been constructed and put in position alongside the wall on the south side of the pier leading to the *Fortune's* dock. This tank is 30 feet long and so constructed that the projectiles can be balanced to any desired inclination. The tank is partly filled by the tide and partly by pump, and will empty itself at low water.

Trolley system.—For the convenience of handling and transporting the automobile torpedoes which may be received for storage a complete trolley system, including turntables, switches, and hoists, has been devised and is nearly ready for putting in place.

In designing this system an endeavor has been made to meet as nearly as possible the probable requirements of our larger type of vessels, and it is hoped by the constant use to which it will be subjected here to demonstrate its adaptability to the purpose.

DIRIGIBLE TORPEDOES.

Patrick torpedo.—No run has been made with the Patrick torpedo during the past year, nor is any contemplated in the near future. The torpedo is, however, kept in such condition that it can be easily prepared for experiment or service when required.

Sims-Edison torpedo.—The Sims-Edison torpedo, forwarded to this station last fall by the company controlling its manufacture, has been held awaiting trial. The Bureau having decided to conduct a series of experiments, manipulating it from a movable base, designs have been prepared, and the work of installing the apparatus on board the tug *Fortune* will be commenced without delay.

STORAGE OF AUTOMOBILE TORPEDO OUTFITS.

Torpedo assembling room.—The second story of the machine shop has been rearranged, and the large room formerly used as a museum is now used as an automobile torpedo assembling room. There are at present stored in it twenty Whitehead torpedoes, of which fifteen are held in readiness for immediate issue. Other shipments are daily expected No difficulty will be experienced in storing as many torpedoes as are likely to be received under present contracts. Such minor repairs and overhauling as the torpedoes may require from time to time can easily be done with the addition of a small amount of inexpensive machinery.

For the purpose of supplying such compressed air as may be necessary for testing air flasks and for charging torpedoes for trial after readjustment one of the air pumps built by the E. W. Bliss Company under their contract with the Department, has been transferred to this station and is now conveniently installed in the small building recently occupied by the carbonic-acid gas apparatus originally used in connection with the trial of the Lay boat. It is proposed to conduct the air from this building to the torpedo assembling room on the second floor of the machine shop and to a convenient point in the house at the end of the dock where the launching tubes are located.

ELECTRICAL LABORATORY.

During the year this laboratory has been successively in charge of Lieuts. McLean, Smith, and Kennedy.

In addition to the usual routine work and instruction, much investigation and experimenting have been done.

The ballistic tests of smokeless powder for small arms in progress at date of last report were continued as long as the weather permitted, but were not, for reasons, resumed this summer.

Investigations, having for their object the determination of the best forms of voltaic batteries for general and special uses on shipboard, are still in progress; and although none have been found which are entirely satisfactory, those giving the best results have been recommended for present use.

The time ball has been dropped, by telegraphic signals from Washington, with its usual regularity.

CHEMICAL LABORATORY.

Prof. C. E. Munroe, who has been in charge of the chemical laboratory for the past seven years, tendered his resignation, and it was accepted by the Department on the 26th of November, 1892. Mr. H. F. Brown, a graduate of Harvard University, was appointed to fill the vacancy thus created, and reported for duty on February 1, 1893, Mr. G. W. Patterson, an assistant, having been in charge of the laboratory during the interval.

The work carried on in the department of chemistry during the past year may be classified under the following topics: (*a*) Torpedo station gun cotton; (*b*) materials used in the manufacture of gun cotton; (*c*) gun cotton for purchase; (*d*) torpedo station smokeless powder; (*e*) materials used in the manufacture of smokeless powder; (*f*) fulminate of mercury and detonators; (*g*) calcium phosphide; (*h*) explosives found in commerce and those received from abroad; (*i*) miscellaneous material; (*j*) investigation of chemical methods; (*k*)p hotographing; (*l*) by-products.

Torpedo station gun cotton.—Complete chemical examination has been made of station gun cotton, lots 151-182, inclusive.

Experiments begun by Prof. Munroe to determine the rate of nitration of cotton in the manufacture of gun cotton at this station have been completed; the determination of nitrogen in the nitrated samples confirm the results of the solubility tests, tending to show that nitration is completed at the end of twenty-three hours. A series of experiments to determine the relative sensitiveness of various explosives with reference to gun cotton has been carried on.' The method of "explosion by influence" was used, and the initial charge in all cases was a block of steam-dry gun cotton, weighing 100 grammes and detonated by a service detonator. The order of sensitiveness was found to be as follows, gun cotton being the least sensitive of all: Gun cotton, explosive gelatin, Judson powder, R. R. P., Emmensite No. 259, Rackarock, Bellite, Forcite No. 1, Kieselguhr dynamite No. 1, Atlas powder No. 1.

Materials used in the manufacture of gun cotton.—Analysis has been made of samples from 70 drams of mixed acids, and the behavior of the same under varying conditions of storage, exposure to sunlight, etc., has been investigated.

Samples of cotton, proposed for use in the manufacture of gun cotton have been examined. Trial dippings were made of samples of absorbent cotton and the resulting products analyzed.

Gun cotton for purchase.—Complete chemical examinations have been made of Dupont gun cotton, lots No. 3 to 37, inclusive.

Torpedo station smokeless powder.—Specific gravity determinations and complete analyses have been made of various samples of torpedo station smokeless powder, and the stability of certain samples of smokeless powder of small grain has been tested by alternate exposure to heat and cold, no change having been noticed after a lapse of nearly one year. Samples of N. T. powder have been subjected to the low temperature of—15° C. without being affected thereby. An extended investigation has been made of the causes which led to the decomposition of certain lots of smokeless powder during manufacture.

Chemical examinations of the materials used in the manufacture of smokeless powder have been made, and much work has been done in the endeavor to obtain chemically pure substances for the purpose.

Analysis has also been made of samples of di-nitro-cellulose offered for purchase, some of which were found to be satisfactory.

Explosives found in commerce and those received from abroad.—Considerable work has been done under this topic, especially on Emmensite No. 259, the examination of which was a prominent feature of the work of the preceding year. The explosive has been tested after prolonged storage in shells and found to have slightly increased in sensitiveness, but otherwise to be unaltered. Analyses have also been made of several foreign powders. Experiments on changes taking place in samples of brown powder have been continued. These experiments, however, are not yet concluded.

Investigation of chemical methods.—The official methods for testing gun cotton in the laboratory at this station have been made a subject for special study, and a large number of experiments have been made in order to find a more accurate and economical method of determining the solubility, and a more speedy process of preparing gun cotton for the stability test.

Experiments on methods of performing the solubility test of gun cotton have given very satisfactory results; the work is nearly completed and a new method will be recommended for adoption. Two processes have been investigated, in both of which the linen filter is abandoned. The apparatus used in the first process is the same as that employed in the analysis of smokeless powders and consists of a filter made from a test tube with asbestos plug. The second process is entirely different, and use is made of a Soxhlet extractor, thus rendering the work automatic and obviating almost entirely the personal error of manipulation.

The investigation of the stability test has been completed as far as the present appliances of the laboratory admit; the numerous experiments which have been made showing the desirability of having a vacuum pump or air blast to expedite drying the gun cotton.

A large amount of work has been done in determining the nitrogen contents of gun cotton by means of Lunge's nitrometer, using samples whose solubility was known. It was hoped that a connection might be established between the per cent of nitrogen and the per cent of soluble material, in which case the expensive solubility test might be omitted and the per cent of soluble material calculated from the per cent of nitrogen. Since it was known that the soluble portion of the gun cotton was that portion which contained the lower nitrate products, it seemed entirely reasonable that our hopes should be realized. The results of a large number of determinations, however, seem to show that the portion of gun cotton which is soluble in ether alcohol, instead of being a definite chemical compound is a mixture of very varying composition, the per cent of which in the gun cotton can not be calculated from the per cent of nitrogen.

Work under this topic has also included the investigation of the methods for making pure methyl alcohol, and for determining quantitatively the per cent of nitrates and nitrites in water.

GUN-COTTON FACTORY.

The destruction of the gun cotton factory by fire, attended by loss of life, on July 3, 1893, has been made the subject of special reports to the Department and the Bureau. A copy of the report of the Board appointed to investigate the cause of the fire is appended. While the direct testimony in regard to the cause is conflicting and unsatisfactory, the opinion of the Board that it was due to a spark caused by the presence of a foreign substance in the picker is concurred in by me as being most probable.

The numerous fires which occur yearly in the various cotton mills throughout the country originate for the greater part in the picker rooms, which differ in no material respect from the one in the gun-cotton factory; and investigation has proven that the presence of gravel, sand, small pieces of metal, or in fact of any hard substance, in the cotton which is going through the picker is sufficient to produce a spark which readily communicates flame to the fluffy cotton with which the atmosphere of the room is filled.

The immediate cause of loss of life was the explosion of some six or seven pounds of dry long-staple gun cotton used for priming detonators, etc., which was loosely stowed in a powder tank, the lid of which was tightly screwed down to exclude moisture.

Three thousand one hundred and seventy-six pounds of service or military gun cotton were entirely consumed by the flames, and some 200 pounds were recovered from the ashes and cinders in a partially consumed state. No explosion, or even rapid combustion, of this cotton occurred, and its behavior under the circumstances has inspired great confidence in its use for naval purposes.

The Bureau having decided to rebuild a plant sufficiently large for experimental work, plans have been prepared and submitted for approval. It is proposed to distribute the plant in three principal buildings, thereby separating the various operations as widely as possible. The buildings are to be of brick, 32 by 36 feet, and located in the western bank, near the site of the old factory.

It is intended that the buildings themselves shall be placed in suitable excavations so that only the roofs will be above the ground. Three sides will be protected by the embankments, and the fourth, or western, will face towards the sea. A suitable tramway passing through the buildings, under the roof, will afford means of communication and transportation. Plans of the buildings as, proposed and approved by the Bureau, are appended hereto.

The work of relaying the sea wall, clearing away the site of the old factory, and excavating for the new buildings has been begun, and is being prosecuted with vigor.

GUN-COTTON MAGAZINES.

The magazines on Rose Island are in good condition and the plan of stowing gun cotton on racks is giving great satisfaction.

There is at present stowed in the magazines (including that in loaded torpedoes) the following amount of serviceable gun cotton: Service blocks made at torpedo station, 40,842; service blocks made by Du Pont, 31,850; or a total of 72,692 blocks, having a weight of 62,563 wet, and equivalent to 46,922 pounds dry.

In addition to this, there are about 1,500 pounds of gun cotton of various shapes and forms, most of which is being retained for the purpose of observation and experiment.

As discrepencies frequently arise in stating the amounts of gun cotton required for different purposes, due primarily to the fact that different units are employed, it is thought desirable that one unit should be adopted. The unit which seems to be the most convenient is the wet weight; that is to say, the weight of gun cotton containing about 33⅓ per cent of water. This is the condition in which all gun cotton (except that which has been specially dried for primers) is kept in store and issued to the service, and it is the weight employed when making shipments by the commercial lines. It is also the standard by which the condition of the gun cotton in service-spar torpedoes and in the war-heads of automobile torpedoes must be tested every quarter in service.

The periodical inspections called for by the instructions show that the gun cotton now on hand is in an excellent state of preservation.

SMOKELESS POWDER FACTORY.

The smokeless powder factory continues under the charge of Lieut. Commander Belknap, who, in addition to the routine work of manufacture, has, since the resignation of Prof. Munroe, conducted all experiments tending to the development of these powders.

With the exception of about three weeks during the month of November, when work was interrupted by the installing of a new engine, and of about four weeks in the early part of this year when on account of the severity of the weather it was impossible to supply either water or steam, work has been steadily carried on by a force varying from three to four hands, which, though small, has sufficed, on account of the experimental character of both plant and product. The total amount of smokeless powder made was 1,462.5 pounds, as follows:

	Pounds.
Granulations, M. N. O, M. N. 1, etc	29
M. N. 2	334.5
M. N. 3	372
M. N. 4	28
M. N. 6	239
M. N. 7	391
M. T. 3	69
Total	1,462.5

Of this amount, 21.5 pounds have been used at the station and 1,252.5 pounds sent to Indian Head for firing tests; 53.5 pounds have been destroyed, and 135 pounds remain on hand.

At first, the principal work done was in endeavoring to obtain by granulation of the smaller-sized cords a powder adapted for use with small arms. Owing to the want of suitable machinery, the granulation was done by hand, and the process was as tedious as the size ot the grains was irregular. A dozen or more powders, varying principally in specific gravities, were made and tested for pressure and velocity. These experiments, while unsuccessful, were not without value, as they demonstrated clearly the need of an agent for controlling the rate of ignition of the grains; and further, the necessity of an increase in the size of the chamber of the .30 caliber rifle used, to permit of a charge of at least 50 grains in order to obtain 2,000 feet velocity. Experiments in regard to the first point were progressing favorably when they were suspended on account of the inclemency of the winter season, and have not as yet been resumed, for various reasons. The lack of a suitable firing range for testing small-arm powders has been a serious inconvenience in carrying on work of this kind at this station; but provision is being made for a range on the west side of the island, where the sea-wall is being relaid preparatory to erecting the new buildings to be used in connection with the gun-cotton factory.

In addition to the dies already in use, one with holes-⅜-inch in diameter, called No. 7, was made in November last for the purpose of forming a larger-sized cord for the 8-inch gun. Much difficulty was experienced at first in freeing the sticks from the solvent and in preventing their cracking and warping during the process. After some experiment the sticks were made straight and whole, but the complete extraction of the solvent, even in the smallest grains, seems to be impossible. It is hardly necessary to say that this is a serious defect, as the presence of a hydrocarbon in an explosive already deficient in oxygen tends, in rapid firing, to the production of gaseous compounds ready to ignite on coming in contact with the air. The experimental substitution of nitrotoluol for nitrobenzol as a solvent did not give results that warranted continuance of the process.

The Bureau having decided to continue to use the factory for the purpose of investigation of certain phenomena in regard to the powders which were not entirely satisfactory, and for the development of a powder suited to the 4-inch rapid-fire guns, arrangements have been made for this purpose and the work is being prosecuted as rapidly as circumstances permit.

The system of manufacture of smokeless powder formerly pursued at this station has been found to be unsatisfactory. The first powders made gave excellent results, which succeeding lots failed to equal, as shown in the following table:

Date.	Gun.	Powder.	Lot.	Made.	Charge.	Velocity.	Pressure.
					Grams.	*Feet.*	*Tons.*
Apr. 10, 1892	1-pounder, R. F.	M. N. 2	*159	Jan.-Mar., 1892	90	1,584	....
Apr. 29, 1892	do	M. N. 2	†159	Feb.-Mar., 1892	90	1,281	9.0
Sept. 13, 1892	do	M. N. 2	163	Apr., 1892	80	1,281	6.9
Do	do	M. N. 2	165	May, 1892	80	1,026	7.9
Apr. 10, 1892	3-pounder, R. F.	M. N. 2	*159	Jan.-Mar., 1892	425	2,177	11.25
Do	do	M. N. 2	*159	do	425	2,313	12.6
Apr. 29, 1892	do	M. N. 2	†159	Feb.-Mar., 1892	440	2,041	9.9
Sept. 13, 1892	do	M. N. 2	163	Apr., 1892	440	1,939	9.0
Do	do	M. N. 2	165	May, 1892	375	1,668	4.5
Do	do	M. N. 2	165	May, 1892	400	1,047	6.7
Apr. 10, 1892	6-pounder, R. F.	M. N. 2	*159	Jan.-Mar., 1892	400	1,724	9.5
Do	do	M. N. 2	*159	do	480	1,902	12.0
Apr. 29, 1892	do	M. N. 2	†159	Feb.-Mar., 1892	450	1,735	8.1
Sept. 13, 1892	do	M. N. 2	163	Apr., 1892	450	1,634	7.5
Do	do	M. N. 2	163	do	510	1,910	10.5

* First lot. † Second lot.

A systematic course of observation of all powders that have been made in the factory, of which samples could be obtained, has been conducted by Lieut. Commander Belknap, for the purpose of determining the causes of this want of uniformity in powders made under as nearly as possible the same conditions.

The various processes of manufacture have been most carefully studied and experiments have been made for the purpose of promoting the durability of the powder. It has been found that some of the processes employed were of little practical value, and they have, therefore, been dropped.

While nitrobenzol adds to the ballistic effect of the powders, as has been proved by experiment, its presence aids the formation of gaseous compounds which ignite, upon opening the breech, with a rush of flame that precludes the possibility of the use of the powder, as it has been made, in the confined places on shipboard. Numerous experiments have been made to remedy this defect by the introduction of oxidizing agents to produce more thorough combustion, but the results have not, so far, been altogether satisfactory.

The experiments made indicate that the attempt to use an oxidizing agent is, so long as the boiling process is necessary for the extraction of the solvent, without other effect than the reduction of the specific gravity of the finished powder. In this connection it should be remembered that gun cotton mixed with an inert substance can not be expected to give, weight for weight, so good ballistic results as the gun cotton itself; but, if by such processes, the vital qualities of the powder can be improved, the gain will compensate for the loss.

Experiments made to render the powder durable have been attended with more success, according to the method of tests employed by exposing samples to a temperature of 65.5° C. until decomposition is produced. Samples from two separate mixtures have recently withstood this temperature for 160 hours without loss of weight or other perceptible change, a result which is unequalled by any other of the powders made, all of those tested having decomposed under similar circumstances at periods varying between 17 and 103 hours.

I desire to call the attention of the Bureau to the zeal and intelligence displayed by Lieut-Commander Belknap in connection with the development of high explosives at this station.

INSTRUCTION.

Officers.—On the 20th of June last a detail of six officers reported for instruction in the care and manipulation of automobile torpedoes. It was desired that the course of instruction should be made as practicable as possible, and with this object in view arrangements were made by which a Whitehead torpedo and launching apparatus, and a Howell torpedo (kindly loaned for the purpose by the Hotchkiss Ordnance Company) would be available for purposes of illustration, and could be taken apart and assembled for practical instruction. The E. W. Bliss Company, contractors for the Whitehead torpedo, and the Hotchkiss Ordnance Company, for the Howell torpedo, courteously offered the facilities of their proving stations at Noyack Bay, L. I., and Tiverton, R. I., respectively, for witnessing adjustments of the torpedoes and methods of conducting tests.

The following general schedule of instruction was decided upon: Six working days in the torpedo assembling room at this station, devoted to detailed instruction in the construction and mechanism of the torpedoes and their appliances; three working days at Whitehead testing station and on board the *Cushing;* three working days at Howell testing station and at the manufactory in Providence, and one day spent at this station for a general review. The scheme has worked most satisfactorily, each detail of officers having seen from fifteen to twenty-five runs of each torpedo under nearly service conditions, and thus becoming familiar with the adjustments necessary in practice.

Up to the present time three details of officers, aggregating nineteen, have received instruction. Another detail is under orders to report. The interest and application shown by the officers are worthy of commendation.

Seamen.—During the past year there have been sixty seamen under instruction. Of these fifteen are now in attendance, two have been discharged by reason of expiration of enlistment, and two have been transferred to general service before completion of course, leaving forty-one who have finished the prescribed course of instruction and been rated seamen gunners.

In addition to the course of instruction hitherto pursued, the seamen have recently been detailed for short periods of service on the torpedo boat *Stiletto*, and they have also witnessed trials of the Howell torpedo at the testing station at Tiverton and of the Hall torpedo at this station. It is believed that a change in the present course can be made to great advantage, and that instruction in the care and handling of automobile torpedoes should be given. As the station will soon be equipped with appliances suitable for this purpose, it is proposed to reduce the time at present devoted to the manufacture of explosives and to other subjects somewhat, and to substitute therefor practical work with the automobile torpedoes and their appliances, which are so soon to form a part of the armament of all new vessels.

TORPEDO MANUALS.

The spar torpedo instructions are being revised, and descriptions of automobile torpedoes and their accessories are being prepared to accompany the outfits when they are issued to the service.

EXHIBITION AT THE COLUMBIAN EXPOSITION.

During the autumn of last year a complete exhibit of such articles as would best illustrate the objects and purposes of this station and the development of torpedoes and torpedo appliances and accessories was prepared for the World's Columbian Exposition at Chicago. The larger part of the exhibit was forwarded by rail in February, and the remainder, consisting principally of explosives, was shipped on the C. S. S. *Blake* in May.

LIBRARY.

The usual additions to the library have been made during the year, and it now contains a total of 3,602 volumes. The card catalogue has been extended to a total of about 4,475 cards.

A few changes have been made in the list of scientific periodicals subscribed for. Many of the incomplete volumes have been filled by exchange or purchase and are now in the hands of the binders.

The necessity of more room for library purposes is well known to the Bureau.

SANITARY CONDITION.

Frequent and rigid inspections of the island are made by the surgeon attached to the station, and changes intended to improve its sanitary condition have been made at his suggestion.

In view of the possibility of an outbreak of cholera in this country an Engle cremator has been purchased and an emergency hospital tent of the army pattern has been procured. The latter proved of great use after the unfortunate accident at the gun-cotton factory.

The excellent health of all attached to the station is proof of its good sanitary condition.

Very respectfully submitted.

G. A. CONVERSE,
Commander, U. S. Navy,
Inspector of Ordnance, in charge of Station.

CHIEF OF BUREAU OF ORDNANCE,
Navy Department, Washington, D. C.

(Blue prints inclosed under separate cover.)

No. 3.

NAVAL TORPEDO STATION,
Newport, R. I., U. S. Naval Torpedo Board, September 12, 1893.

SIR: I have honor to submit the following report of the operations of the torpedo board for the past year:

PERSONNEL.

Lieut. F. J. Drake ceased to be a member of the board December 19, 1892, when he was detached from duty as inspector of the Howell torpedo at the works of the Hotchkiss Ordnance Company, Providence, R. I. Lieut. A. P. Osborn succeeded him, but was detached December 30, 1892. Lieut. J. H. Oliver became inspector and member of the board February 10, 1893.

Lieut. T. C. McLean ceased to be a member of the board February 28, 1893. He was succeeded by Lieut. John Hubbard, inspector of the Whitehead torpedo at the works of the E. W. Bliss Company, Brooklyn, N. Y.

Lieut. C. A. Bradbury was granted sick leave April 15, 1893. His place has been supplied by Ensign F. L. Chapin, who is the representative of the board in the Bureau of Ordnance at Washington.

Lieut. F. F. Fletcher, commanding the torpedo boat *Cushing*, was made a member of the board April 25, 1893.

Lieut. R. C. Smith has been a member of the board since May 17, 1893. He is in charge of the practical work of the board at the torpedo station, and has had charge of the torpedo boat *Stiletto* during the trials of the Howell torpedo.

WHITEHEAD TORPEDOES.

One hundred of these torpedoes were contracted for with the E. W. Bliss Company, Limited, of Brooklyn, N. Y., on May 19, 1891.

On November 22, 1892, the contractors requested that the requirements of the specifications of the contract for the manufacture and delivery of the one hundred torpedoes be modified so as to provide that the limit of deviation at the 800-yard target be increased from 12 yards, from the right or left of the center, to 24 yards; that the requirements for speed at 800 yards be placed at 26 knots, and at 400 yards at 30 knots.

The matter was referred to the consideration of the torpedo board, which recommended that the specifications for the acceptance of the first ten torpedoes only be modified so as to read as follows:

> (*h*) Each torpedo of the first ten is to be set for a range of 800 yards, and the depth, speed, and direction taken at 400 or 800 yards. The limits of deviation from a line passing through the launching tube and the centers of the targets is to be not more than 8 yards to the right or left at 400 yards and 24 yards at 800 yards. The limit from set depth not to exceed 15 inches at both ranges.
>
> (*i*) The above conditions must be obtained with each torpedo in three out of five consecutive runs, when the torpedo is discharged from a launching tube not less than 4 feet above water, and the mean speed of the three runs is to be at least 26 knots for the range of 800 yards. A further run is to be made from a tube not less than 4 feet above water, and in this run the torpedo must pass within 8 yards of the center of the 400-yard target, and the speed is to be at least 30 knots for the range of 400 yards.

The board further recommended that the specifications governing the acceptance of the last ninety torpedoes be modified to read as follows:

> (*h*) Each torpedo is to be set for a range of 800 yards, and the depth, speed, and direction taken at 400 and 800 yards. The limits of deviation from a line passing through the launching tube and the centers of the targets is to be not more than 8 yards to the right or left at 400 yards and 24 yards at 800 yards. The limit from the set depth is not to exceed 15 inches at both ranges.
>
> (*i*) The above conditions must be obtained with each torpedo in three out of five consecutive runs when the torpedo is discharged from a launching tube not less than 4 feet above water, and the mean speed of the three runs is to be at least 26.5 knots for the range of 800 yards. A further run is to be made from a tube not less than 4 feet above water, and in this run the torpedo must pass within 8 yards of the center of the 400-yard target and the speed is to be at least 30 knots for the range of 400 yards.

These recommendations were concurred in by the Bureau, approved by the Department, and accepted by the contractors.

Up to August 9, 1893, the first ten torpedoes had been accepted. Upon the request of the contractors, the Bureau ordered the torpedo board to assemble at the Torpedo Station, Newport, to consider the advisability of removing the 400-yard net when firing at the 800-yard target, and to consult with the contractors on other matters pertaining to the torpedoes.

The board assembled as ordered on August 7, and proceeded on the 8th to the firing ground in Noyack Bay, Long Island, where torpedo trials were witnessed during the 8th and 9th. A copy of the official report of the board, and the recommendations made after witnessing the trials, is appended hereto, marked A.

The recommendations as to the modification of Amendment B of the specifications governing the trial and acceptance of the last ninety torpedoes contracted for, was concurred in by the Bureau of Ordnance, approved by the Department and accepted by the contractors. Since the 9th of August 18 torpedoes have been accepted.

As fast as accepted the torpedoes are sent to the Torpedo Station, Newport, and stored ready for issue to vessels as required.

The torpedoes accepted have demonstrated by their performance their excellence of manufacture, and, it is thought, their full equality with any of the same type made abroad. The contractors are now in possession of an excellent plant for the manufacture of Whitehead torpedoes and launching apparatus. The results arrived at have only been obtained through thorough, conscientious, and expensive work on their part.

HOWELL TORPEDOES.

On October 20 and 21, 1892, the torpedo board witnessed trials at Mackerel Cove of two Howell torpedoes (contractors' Nos. 5 and 6).

These were presented for official tests by the agents of the Hotchkiss Ordnance Company, but upon trial were found not to be in proper adjustment. Both torpedoes were then temporarily withdrawn from official tests.

In July, 1893, seven torpedoes were presented for official trials at Tiverton, R. I., where the contractors have established a good firing station. The tests, before members of the board, began July 15, and continued until August 2. On August 3 the *Stiletto*, which was to be used for the firing trials while under way, as required by the specifications, broke her low pressure cylinder. This accident, and the delay incident to the preparation of a proper platform for firing the torpedoes from a height of 11 feet above the water level, have temporarily suspended the trials.

The tests already made show that the torpedoes presented fulfill the contract requirements as to speed and accuracy for a range of 400 yards, when fired from a fixed platform 2½ feet above the surface.

The one torpedo accepted during the previous year has been in use at the torpedo station as a model for the instruction of officers and seamen gunners.

HALL TORPEDO.

Trials of this torpedo have continued at the torpedo station under the personal supervision of Lieut. M. E. Hall, the inventor. Since the date of the last report, important modifications have been made in the mechanical details of the torpedo, which have resulted in a marked improvement in its performance.

DIRIGIBLE TORPEDOES.

No torpedoes of this type have been brought before the board for trial. The Department is in possession of three Patrick torpedoes, one stowed at the torpedo station, the other two at the Mare Island navy-yard, California.

The Sims-Edison torpedo sent to the torpedo station last year has not yet been tried.

Mr. Sims has made a proposition in detail for a trial of this torpedo from the tug, *Fortune*, when that vessel is moving at speed. The torpedo would be carried in the gangway and hoisted overboard by a suitable derrick. The electrical power needed would be supplied by an engine and dynamo temporarily located on the forecastle deck.

The Bureau has accepted Mr. Sims' proposition, and arrangements are in progress for carrying out the experiment.

THE CUNNINGHAM ROCKET TORPEDO.

A run of this torpedo was witnessed by two members of the board at New Bedford, Mass., on July 17, last. A copy of their report is appended hereto, marked B.

LAUNCHING APPARATUS.

Howell.—The fifteen tubes contracted for with the Hotchkiss Ordnance Company are finished. Two of them were installed on board the *Stiletto* last year for trials of the torpedo from a vessel underway. The acceptance of the tubes is contingent upon the acceptance of the torpedoes.

Whitehead.—The amount of launching apparatus contracted for with the E. W. Bliss Co., comprises:

Tubes (fitted for powder discharge)	58
Tubes (fitted for air and powder discharge)	2
Upper deck broadside mounts	10
Lower deck broadside mounts	40
Turn table twin tube mounts	2
Turn table single-tube mount	1
Air compressors, type 2 (Whithead design)	10
Air compressors, small, special type	1
Accumulators	10
Loading trays	53
Spoons	15

In addition to the above the Bureau has the following apparatus procured from Whitehead & Co., Fiume, which is used as models and for experimental purposes, viz: One tube (fitted with air and powder discharge), one turn-table single-tube mount, two air compressors, type 1, one air compressor, type 2, one accumulator.

The Bureau has also one small air compressor of Brotherhood type, purchased as a model, and one lower deck broadside mount and connection made at the navy-yard, Washington.

All the material completed has been tested by a member of the board and there remain yet to be delivered, 36 tubes, 36 lower deck mounts (with broadside connections), and ten accumulators.

Difficulty has been found in obtaining suitable castings for the broadside connections, and the company furnishing the stock for accumulators has been obliged to put in special machinery for making them.

TORPEDO BOATS.

The *Cushing* and the *Stiletto* have been extensively employed in connection with the acceptance tests of the Whitehead and Howell torpedoes, respectively, and for collecting data to be used in the preparation of instructions, drills, etc. They have also served for the instruction of officers and seamen gunners in automobile torpedoes and their accessories, and in the maneuvering of torpedo boats.

The valuable information and experience thus gained in the practical handling of torpedoes has been of the greatest utility in remedying defects and supplying deficiencies which otherwise might not have been discovered until the outfits had been issued to service.

SUBMARINE TORPEDO BOATS.

Two members of the board conducted an examination and trial of the Baker Submarine Boat at Chicago, Ill., on November 26, 1892, and in a memorandum addressed to the Bureau, dated December 15, 1892, reported that the trial had "satisfactorily demonstrated the practicability of its (the boat's) development as a weapon of warfare." A copy of the memorandum referred to is appended, marked C.

Upon the formation of a special board on submarine boats in June, 1893, this subject ceased to come under the cognizance of the torpedo board.

THE DESTROYER'S SUBMARINE GUN AND PROJECTILES.

No further experiments have been made, since the date of last report, with the submarine gun and projectiles.

The *Destroyer* has been transferred to the Torpedo Station at Newport, and the experiments will be resumed at an early date. The projectiles used in last year's trials have been repaired and refitted with necessary firing attachments. Five new projectiles of the Bureau's design have been made by the Continental Iron Works of Brooklyn, N. Y., the order for which was placed March 2, 1893. These projectiles have been reported as completed, and orders have been issued to ship them to the torpedo station.

It is proposed to use the old projectiles in testing the efficiency of torpedo nets which are now at the torpedo station.

INVISIBILITY OF TORPEDO BOATS.

During the year experiments have been made, whenever circumstances would permit, for the purpose of determining the color of paint best suited to torpedo boats. Most of these experiments have been conducted at the torpedo station, and will be continued there until a conclusion has been reached. While the dark olive green color with which the *Cushing* and *Stiletto* were painted some time ago gave good results, the effect of a slight variation in the shade is being tried.

The following conclusions are drawn from the experiments thus far made: For torpedo boat attacks, dark, misty nights are the best, as the beam of electric search lights then has little penetration. Clear nights are not good, even if dark. The boat should approach in color the prevailing color of sky, water, and coast in the locality where it is to be used. The color should be dead, not glossy. Even the glistening of the paint caused by being wet by spray is objectionable. If the smoke pipe shows white from effects of salt water, it should be washed with fresh water, or covered with tarpaulins. The boat should try to move against a dark background, as for example, a rocky coast, when practicable. It is more readily detected when silhouetted against light objects, or even the sky. The boat should head for the light as long as possible, as she will then be bows on, and not present much surface when the light strikes her. If necessary to head off, she should still turn bows on when the beam approaches, and resume her course when it is passed.

The experiments also indicate the advisability of placing the search lights as low down as the construction of ships and weather conditions will permit. The observers should be in a dark place, out of the glare of the light, and preferably near the surface of the water.

In the large number of experiments made at the torpedo station, the *Cushing* has succeeded in entering the harbor, and even in getting to her moorings, without having been detected, in many instances, although the approximate time of her arrival has been known, and the search light in the tower of the electrical laboratory has been skillfully managed. In a recent experiment, the *Cushing* succeeded in getting well within torpedo range of the *San Francisco* before being detected, although all of the search lights of that vessel were endeavoring to discover her.

APPLIANCES FOR HANDLING TORPEDOES ON BOARD SHIP.

This subject has been before the torpedo board at two meetings; the first at the torpedo station, March 21, 1893, and the other at New York, April 29 and May 1, 1893, when the board, by order of the Bureau, visited the foreign men-of-war then concentrated in New York Harbor, for the purpose of obtaining information regarding the methods of handling, stowing, and manipulating torpedoes on board ship, and the fitting of defense nets, etc.

As a result, experimental trolley rails, switches, and turntables, hoists, transporting straps, torpedo tail covers, and trucks for transporting torpedoes on deck, have been designed, and are being made at the torpedo station with a view of selecting those best adapted for use.

Receptacles for carrying and stowing the dry gun-cotton primers and exploders have been made, and will be submitted to the Bureau for approval.

Incidental to all this work, a nomenclature has been adopted provisionally, and the work of preparing illustrated descriptions, and rules for the care and preservation of all articles forming the outfit, and of suitable drills for both types of automobile torpedoes is well advanced.

Very respectfully submitted,

G. A. CONVERSE,
Commander, U. S. Navy,
President of Naval Torpedo Board.

To the CHIEF OF THE BUREAU OF ORDNANCE,
Navy Department, Washington, D. C.

A.

NAVAL TORPEDO STATION,
Newport, R. I., August 11, 1893.

SIR: (1) In compliance with the instructions of the Bureau, directing that the torpedo board assemble in order to ascertain whether any modification of the present method of testing the Whitehead torpedo is necessary or desirable, the board has the honor to report as follows:

(2) *Method of observation.*—In order to determine the speed of the torpedoes as accurately as possible, five officers with stop watches were stationed at the nets and on board the *Thorp.* From the times taken by these five officers, the board concludes that the true time of the travel of the torpedo can not be reliably obtained closer than within 0.75 seconds by the method employed; and is also of the opinion that it is not feasible to make any changes in this method.

(3) *Reduction of speed due to above water discharge.*—In order to determine whether any, and, if any, what reduction in time of travel of the torpedo should be made for retardation due to the initial dive, and for the time required in attaining its normal speed, a torpedo, having the same setting of regulator and initial pressure in air flask, was run three consecutive times over the 400-yard range, and the time was taken between the instant of striking the water and that of passing through the net. Three more consecutive runs were then made with the same torpedo, the point of launching being about 75 yards in front of a first net, and the time of travel was taken between the passage of the torpedo through the first net and through a second 400 yards distant from the first. From these trials the board concludes that there should be allowed a reduction of at least 1 second in time, as between this method of launching and that of the under-water discharge, upon which the specifications were based.

(4) *Deflection caused by the 400-yard net.*—While the board is not prepared to state that this net actually does deflect the torpedoes from their course the probability is that it does, as pieces of net are frequently found between the propeller hubs. Since the only purpose, within the specifications of having a net at 400 yards, during the 800-yard run of the torpedo is to determine the deviation and depth at the former distance, and since these two requirements, as well as that of speed, can

be determined by a subsequent run at 400 yards it appears advisable that no intermediate net should be used when testing at the 800-yard range.

(5) In view of the foregoing facts, and from observations of the performance of the torpedoes now undergoing tests, the board is of the opinion that the best interests of the service will be promoted and justice done the contractors by withdrawing the present Amendment B of the specifications (a copy of which is attached) and substituting therefor the following:

SUBSTITUTION FOR AMENDMENT B OF PRESENT SPECIFICATIONS.

(*h*) Each torpedo is to be set for a range of 800 yards and the depth, speed, and direction taken at that range. The limits of deviation at the 800-yard target shall not be more than 24 yards to the right or left of the center of that target. The limit from the set depth shall not exceed 15 inches.

(*i*) The above conditions must be obtained with each torpedo in three out of five consecutive runs when the torpedo is discharged from a launching tube not less than 4 feet above water, and the mean speed of the torpedo, as determined by these three runs, must be at least 26.5 knots for the range of 800 yards. A further run is to be made from a tube not less than 4 feet above water, and in this run the torpedo must pass within 8 yards of the center of the 400-yard target. The speed of the torpedo must be at least 30 knots for the range of 400 yards, and the limit from the set depth shall not exceed 15 inches.

Finally, the Board states that, in its opinion, the inspector conducting the tests should be directed to make a deduction of one second from the observed times for retardation due to above water discharge, and that, as all observed times are liable to a possible error of 0.75 second, due to the imperfect method of timing, the inspector should be authorized to accept such torpedoes as fulfill all other specified requirements, and in which the speed, as determined by observation, does not fall below the contract speed by an amount in excess of that due to the above possible time error.

Very respectfully,

G. A. CONVERSE,
Commander and President of Torpedo Board.
JOHN HUBBARD,
Lieutenant and Member of Torpedo Board.
F. F. FLETCHER,
Lieutenant and Member of Torpedo Board.
JAMES H. OLIVER,
Lieutenant and Member of Torpedo Board.
R. C. SMITH,
Lieutenant and Member of Torpedo Board.
F. L. CHAPIN,
Ensign and Member of Torpedo Board.

(B.)

NAVAL TORPEDO STATION,
Newport, R. I., August 14, 1893.

SIR: (1) In obedience to the Bureau's order of the 1st of July, ultimo, we visited New Bedford, Mass., on the 17th of the same month and witnessed a run of the Cunningham rocket torpedo. In connection therewith we submit the following report:

(2) The trial was made at high water, about 11 a. m., from Beetle's boat yard, East French avenue, Clark's Point, New Bedford. Mr. J. L. Gillingham, jr., president of the company, received the board. The trial was conducted by the inventor, Mr. Patrick Cunningham. Prior to firing the torpedo two photographic views were made by direction of the board. A third view was taken at an angle with the range as the torpedo was making its run. These views and a blue print from a tracing of a drawing made at this station from plans furnished by the inventor are appended to this report.

(3) The torpedo was made in four sections, each approximately 4 feet in length. The total length was 17 feet. The head was of copper, with a maximum diameter of 15¼ inches, which was also the diameter through the rifling ribs on the cylindrical sections of the torpedo. The head, fitted with nose ring and steel point at the forward end and a wooden disc held in place by thumbscrews at the rear end, contained 130 pounds of crushed coal and sand, representing the charge.

(4) The remaining sections were of riveted sheet steel, No. 12, A. W. G. They were joined to each other and to the head by riveted screw rings. Between the copper head and first cylindrical section was a steel casting, forming the head of the forward rocket composition chamber. The reduction of diameter abaft this head was $1\frac{1}{4}$ inches, forming a projecting rim on the after face of the casting. This rim was perforated with sixty $\frac{9}{16}$-inch holes, inclining inward and communicating with the hollow of the casting. These holes permitted the rearward escape of the gas from the burning composition.

(5) The shells of the two middle sections were cylindrical and practically interchangeable. The shell of the after section was conical, tapering 4 inches in diameter from front to rear. The rear end was closed with a steel casting perforated with eighteen $1\frac{1}{16}$-inch holes. These holes inclined inward and communicated with the after rocket composition chamber. A screw eyebolt projecting aft in the axis of the torpedo was used for convenience in handling.

(6) Along the cylindrical and after sections of the torpedo were riveted eight rifling ribs of angle-iron section and of the same material as the shell. The rifling was right-handed, one quarter turn in the 12 feet of its length, or 1 turn in 48. The profile of the ribs coincided with the maximum diameter of $15\frac{1}{4}$ inches, which gave a width of rib of $\frac{3}{4}$ inch forward and $2\frac{3}{4}$ inches aft.

(7) Through the center of the three after sections ran an iron tube one-fourth inch thick and about 8 inches in diameter. The joints were made by screw rings. The whole capacity of this tube was designed for rocket composition, but in the trial witnessed by the board the end sections only were filled, the middle section being blanked off. The forward section contained 118 pounds and the after section 125 pounds of rocket composition compressed to 10 tons to the square inch. A hollow cone opening toward the ends formed the initial surface of ignition. The vent holes were sealed with a waterproof composition. Through one of them at each end led the insulated wires carrying the electrical fuse designed to ignite the composition. The total weight of the torpedo as loaded was said to be 1,200 pounds and its reserve buoyancy in salt water 32 pounds.

(8) The apparatus for firing was an iron tube to fit the diameter of the torpedo mounted on a cradle running on launching ways. The breech was closed by a hinged and latched door. The tube was not water-tight at breech or muzzle. When ready for firing the cradle was run into the water and wires connected. A buoy, distant 1,000 feet, marked the range. For a distance of 100 feet from the tube the depth of water did not exceed 5 feet. The bottom was thick mud. At the time of firing the tube was 3 feet under water, which left the torpedo 2 feet clear of the mud.

(9) On connecting the battery to fire an appreciable interval elapsed before the torpedo cleared itself of the tube. Much mud and water was thrown out for 100 feet. The volume of gas escaping seemed enormous. At about 200 feet the torpedo left the water, rising 2 feet, and returned at about 250 feet. It ceased to run at 900 feet and went to the bottom. The time for this distance was 45 seconds, equivalent to a speed of 11.84 knots per hour. A considerable loss of time occurred before the torpedo got clear of the shoal water and mud. The course of the torpedo for the run did not deviate sensibly from a straight line to the right or left. No method existed of determining the vertical deviation, except when the torpedo left the water.

(10) The inventor states that in deep water, with a full charge of rocket composition and a powder discharge from the tube, any desirable speed may be obtained for 1,000 feet. The scope of the invention, from his standpoint, contemplates its use under any circumstances in which the Ericsson submarine gun would be applicable. A copy of a telegram received to-day from the president of the company is appended to this report.

Very respectfully,

G. A. CONVERSE,
Commander, President of the Torpedo Board.
R. C. SMITH,
Lieutenant, Member of the Torpedo Board.

CHIEF OF THE BUREAU OF ORDNANCE,
Navy Department, Washington, D. C.

[Copy of telegram.]

NEW BEDFORD, MASS., *August 14, 1893.*

Torpedo recovered to-day, condition perfect, forward rocket missed fire, distance over 900 feet, deflection less than 10 feet. Will you or your assistant come over and see torpedo before taken apart Tuesday?

JAS. L. GILLINGHAM.

Commander CONVERSE,
Torpedo Station, Newport.

C.

MEMORANDUM FOR CHIEF OF BUREAU OF ORDNANCE.

BUREAU OF ORDNANCE, NAVY DEPARTMENT
Washington City, December 15, 1892.

In the opinion of the torpedo board the examination and trials of the Baker submarine boat, conducted in its presence at Chicago, Ill., on the 26th November, 1892, satisfactorily demonstrated the practicability of its development as a weapon of warfare.

With a submarine boat constructed on the Baker principal, and of sufficient power, dimensions, and displacement to permit the installation of a launching tube for automobile torpedoes or a submarine gun, it would be possible to approach within striking distance of an enemy's ship with greater immunity from danger than by any other known means.

As a base from which to maneuver dirigible torpedoes, this type of vessel possesses great advantages, among the most important of which are:

First. The ability to approach within practical maneuvering distance of an enemy with comparative safety and reduced probability of detection.

Second. The very great enlargement of the territory that could be covered by the dirigible torpedo when provided with a movable base, as the limit of that territory would depend solely upon the effective radius of the boat's action.

A combination of the submarine boat; as a base, with a dirigible torpedo like the Patrick or the improved Sims-Edison as a weapon, would afford a very powerful auxiliary for defensive purposes, and possess promising features for development as an offensive weapon.

GEORGE A. CONVERSE,
Commander, U. S. Navy,
President Torpedo Board.
C. A. BRADBURY,
Lieutenant, U. S. Navy,
Member Torpedo Board.

No. 4.

NAVAL TORPEDO STATION,
Newport, R. I., July 14, 1893.

SIR: (1) In obedience to your order of the 10th instant, the original of which is appended (marked A), we have investigated the circumstances attending the destruction of the gun-cotton factory at this station on the 3d of July, instant, and have the honor to report as follows:

ORIGIN OF FIRE.

(2) The fire appears to have originated in or near the "picked-cotton room" S (on plan of factory appended, marked B), at about 1:35 p. m., July 3. The picking machine 36 was in operation, and was tended by Dennis Mahan, first-class laborer. His station was in the "picking room" T. At the time mentioned, he heard a noise or concussion, as of a door flying open and striking something soft, in the direction of the corridor between S and P. He supposed the door between S and the corridor had been blown open by the draft from the picker. It was held by a button, which sometimes worked loose. He looked into the corridor; the door was closed, but a fire had broken out in a quantity of English bleached cotton stowed against the partition separating the corridor from the room P. The upper half of the door between S and the corridor consisted of a frame covered with wire netting. Mahan could not account for the noise he heard, and had no idea of the cause of the fire. He did not know whether there was any fire in the room S; he thought not, but could not tell. He would have known if anything metallic had passed through the picker. He thought nothing had. There had been an occasion when an iron cotton hook was found in room S, and its presence there could not be accounted for unless it had passed through the picker. Such passage, however, had not been noticed. He shouted fire, alarmed the other workmen, ran for fire buckets in room U, but found them empty; then got out of the building. He returned later and helped pass out wet gun cotton from room J. He knew of a tank containing about 7 pounds of dry, long-staple gun cotton, which was in room O, but knew of no order to throw it

out in case of fire. He knew of the fire hose and pump having been tested on the 1st instant. He did not know whether the sprinklers had been turned on. There were seven or eight powder tanks, closed air-tight, and containing dry, picked cotton ready for dipping in room O.

(3) Lauritz Julienssen, first-class laborer, was picking raw cotton by hand in room V. He heard Mahan call fire, and rushed through the central corridor to tell Harrington, who was attending the poacher S. He did not see the flames at this time; did not know of the tank of dry gun cotton in room O, or of any order to throw it out. After first leaving the building, he returned and helped throw out wet gun cotton from room J.

(4) Jeremiah Harrington, first-class laborer, foreman of the factory, and Frank Loughlin, second-class pipe fitter, assistant foreman and engineer, went to the north end at the alarm, and after seeing the flames appear to have left the building immediately. They both reached the machine-shop building to report to Lieut. Commander Belknap about the time the alarm was sounded. Harrington reported that the fire was caused by spontaneous combustion of the English cotton. Mr. Belknap asked them if water had been turned on, to which they replied no. Later, Harrington made the same report as to the origin of the fire to the inspector of ordnance in charge.

(5) There is no other direct evidence as to the cause and origin of the fire. The board, after careful consideration, accept the opinion of Lieut. Commander Belknap, superintendent of the gun-cotton factory, expressed, in his report of the 10th instant to the inspector of ordnance in charge, a copy of which is appended, marked C. It is extremely improbable that thoroughly clean, dry cotton could develop spontaneous combustion. The board is therefore of the opinion that the fire originated in a spark from the picker, caused by the teeth striking a foreign substance accidentally fed in with the cotton. It has been the custom to take every reasonable precaution against such an occurrence. All the cotton fed to the picker was first hand picked in room V to free it from foreign substances. A fire in room S would undoubtedly communicate itself to the cotton in the corridor through the wire netting of the door in a very short time. Mahan's idea that the fire originated where he first saw it was natural, but does not impair the other view. He could not have told at the time whether there was fire in room S or not.

FIRE STATIONS.

(6) Appended to this report are D, the general fire bill; E, rules for the gun-cotton factory; and F, rules for conduct of crew at gun-cotton factory in case of fire; copies of all of which are posted in the factory, and the crew instructed in their provisions. The last exercise at fire stations was held on the 1st instant. The foreman and his assistant were specially instructed in all the requirements; but ordinarily the laborers, who were subject to change from time to time, were given simple duties only, to avoid confusion. They were directed to give the alarm, and then lead out the nearest hose. The foreman and his assistant had been repeatedly instructed in the case of fire to throw out a labeled tank of long-staple dry gun cotton, kept near the northern window of room O, and used for igniters and vent sealing primers.

(7) All the statements point to the fact that the crew were demoralized by the suddenness of the fire and its rapid spreading and left the building at once. No alarm was turned in from the factory, though there were push buttons at three different points; the salt-water pump was not started; the hose was not led out; and the sprinklers connected with the stand pipe were not turned on. These facts are demonstrated by an inspection of the valves and fittings since the fire. Mahan states that he went for fire buckets in room U, but found them empty. The weight of evidence indicates that he got out of the building without stopping for anything.

No filled buckets were kept in the north end of the building. In the south end there were buckets for use in the cooling room. A fire hose was bighted down near the cock 42 in the north end of the main hall, and another near 43 in the central part of the building, both of which would have reached the seat of the fire. No. 44 was another cock with hose attached in the south end, and 45 was the valve for admitting steam to the salt-water pump in the room below. The sprinklers were in the final drying room R.

THE EXPLOSION.

(8) This occurred in room O, blowing the side of the building out to the east and northeast. From an inspection of the ruins and the statements of witnesses, it seems evident that the source of the explosion was the tank containing six or seven pounds of long-staple dry gun cotton. This was closed air-tight, which, with the heat from the flames, furnished the necessary conditions to produce a second-order

explosion of dry gun cotton. All the results bear this out. The explosion was accompanied by a dull, heavy report, differing distinctly from the sharp ringing crack of a detonation, or explosion of the first order. The effects were wide-spread, rather than local, a considerable portion of the wall of the building being blown out, and the roof over the seat of the explosion being lifted bodily. Although débris was thrown out laterally with violence, there was none of the vertical effect attendant on the detonation of gun cotton under timbers. An examination of the ruins showed boarding, joists, and floor timbers wrenched and splintered, but none were found with the clean cuts across grain, which a detonation would have produced. The pieces of copper tanks found, though badly torn, did not exhibit the peculiar erosion usually attending detonation. The tanks which contained dry raw cotton for dipping show evidence of fusion or perforation from the outside. This is conclusive that their contents had no part in the explosion. The location of the explosion, the point also where the tank of dry gun cotton was known to stand, is clearly indicated by the clean, bare appearance of the earth for a distance of several feet. Elsewhere the surface is covered with cinders and débris.

CONDUCT OF THE FIRE.

(9) The first alarm was given by Printer Dunphy, who saw the smoke and flames from the printing room in the machine-shop building. Harrington and Loughlin arrived in the building almost immediately after to report to Lieut. Commander Belknap. The general alarm was sounded at once, and the reel and ladders were promptly on the scene. The first two hoses were attached to the fire plug marked 1 on the plan G, appended. One was carried to the north end of the building, the other to the central door. The flames had now got too much headway to be controlled. The inspector of ordnance in charge ordered that the north end be abandoned and all streams concentrated on the wet gun cotton in the middle and south end of the building. Another hose was coupled to the plug marked 2 and led to the central door. The order to abandon the north end was repeated by Lieut. Commander Belknap, but before it could be obeyed the explosion occurred. This must have been about 1.50 p. m. The men killed and injured were on the hose, near room O, and were close to, or had just broken in, the window to thrust in the nozzle. After the explosion all streams were directed on the central part of the building to keep the finished gun cotton wet, the nozzlemen lying below the bank. Some of the wet gun cotton, about 800 pounds, had been passed out from the building. The remainder, about 2,700 pounds, with the exception of portions of several boxes, was consumed without explosion. The unconsumed blocks remained in the ruins, burned to different stages, many of them intact. The packing boxes were burned and charred to various degrees. The duration of the fire from its discovery to the destruction of the building was approximately one hour.

The appliances for fire, both in the factory and at the station, were ample for all ordinary contingencies. Had the directions as to extinguishing apparatus and the throwing out of dry gun cotton been observed by the crew at the factory at the first alarm, the fire, though probably too extensive to be at once extinguished, might have been confined to the northern end of the building, and there would have been no explosion and no loss of life.

(10) The usual personnel of the station were present at the time of the fire, with the exception of the crew of the *Stiletto* and Lieut. Commander Kennedy, Lieut. Holman, and Lieut. Smith, who were all absent on duty. Commander Converse directed the work of combating the fire from the bank opposite the center of the building, in about the position marked W in the plan G. Lieut. Commander Belknap was on the bank near fire plug 1, and Ensign Capehart, at the time of the explosion, was on the edge of the bank near room O, at the position X. The men killed or injured were all on or near the hose whose stream was being directed towards room O. Harrington, Loughlin, Reagan, and Burns were at the nozzles, close to the east side of room O. According to Burns's statement, Loughlin seemed specially anxious to get the stream into room O. Harrington had been away to get a ladder, and had just joined the others.

(11) The complete list of killed and wounded is as follows:

Killed.—Jeremiah Harrington, first-class laborer; Frank Loughlin, second-class pipefitter; Michael Reagan, first-class laborer.

Injured.—E. E. Capehart, ensign; Daniel Burns, quartermaster, third class; L. J. G. Kuhlwein, seaman; P. Nilsson, landsman; Ky. Kennel, third-class laborer; L. Julienssen, first-class laborer; J. A. Dunphy, first-class printer; M. F. O'Sullivan, first-class blacksmith; Geo. A. Brown, first-class joiner; James Marren, first-class laborer.

(12) After the alarm was given every possible effort was made by the whole personnel to subdue the flames. The conduct of most of the men erred on the side of daring. The greatest difficulty was experienced in keeping them back out of danger.

(13) Appended to this report are twelve photographs of the ruins as they appeared on the 6th instant.

1. General view from northeast.
2. General view from north.
3. General view from southeast.
4. General view from south.
5. View of northeast corner of room O, showing ground bared by force of explosion, and remains of powder tanks in which dry raw cotton was kept.
6. Center and north end from east.
7. Doorway in center of building, showing remains of wet gun cotton.
8. Center of building from north end, showing remains of wet gun cotton.
9. South end from southeast.
10. Basement door at south end.
11. Smokeless powder mixing house distant 40 feet from point of explosion, and in face of room M.
12. Remains of wet gun cotton gathered from ruins.

Respectfully submitted.

DUNCAN KENNEDY,
Lieutenant, U. S. Navy.
GEORGE F. W. HOLMAN,
Lieutenant, U. S. Navy.
R. C. SMITH,
Lieutenant, U. S. Navy.

Commander G. A. CONVERSE, U. S. Navy,
Inspector of Ordnance, in Charge.

[Indorsement.]

TORPEDO STATION,
Newport, R. I., July 20, 1893.

The foregoing report is approved. The opinion of the board that a spark from he picker produced by the presence of a foreign substance in the cotton with which it was being fed is accepted by me as the most probable cause of the fire.

G. A. CONVERSE,
Commander, U. S. Navy, Inspector of Ordnance, in charge

A.

NAVAL TORPEDO STATION,
Newport, R. I., July 10, 1893.

GENTLEMEN: (1) You are hereby appointed a board of investigation to inquire into circumstances attending the destruction of the gun-cotton factory at this station on the afternoon of the 3d of July, instant.

(2) You will make your report in accordance with the requirements of article 1720 of the U. S. Navy Regulations, 1893.

(3) It is desired that in your investigation particular attention be given to ascertaining, if possible, the immediate cause of the fire, concerning which great doubt exists.

Respectfully,

G. A. CONVERSE,
Commander, U. S. Navy, Inspector of Ordnance, in charge.

Lieut. DUNCAN KENNEDY, U. S. Navy.
Lieut. G. F. W. HOLMAN, U. S. Navy.
Lieut. ROY C. SMITH, U. S. Navy.

C.

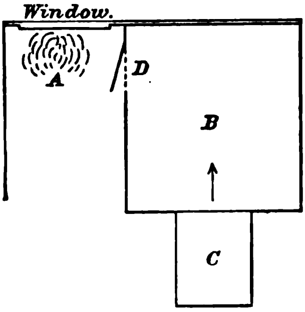
NAVAL TORPEDO STATION,
Newport, R. I., July 10, 1893.

SIR: (1) I beg leave to make the following report concerning the recent fire in the gun-cotton factory, covering points upon which information is desired by the board of investigation.

AS TO THE CAUSE OF THE FIRE.

(2) The fire was discovered by an employé named D. Mahan, who was at the time running the picker. He states that he heard a noise like the slamming of a door of the room into which the picker fed, and, stepping aside to see if the door was open, saw flames issuing from a pile of cotton just outside the door, which was shut.

(3) When the picker was in use it made a strong draft of air, which carried the light, fluffy particles of the picked cotton to the extreme end of the room (B) and through the large meshes of the wire screen which was let into the upper part of the door (D). After running the picker it was customary to collect these fluffy particles to use around the factory, as they were not suitable for dipping. Sometimes when the picker was running the button which held the door would work loose, and the door, forced by the draft, would fly back with a bang against the side of the building, and Mahan thought that this caused the noise he heard.



C. Picker.
B. Room into which picker fed.
A. Where Mahan saw fire.

(4) I believe, however, that a spark caused by the picker striking in its revolutions a piece of metal or gravel ignited the dust in the room, that the dust burned with a light explosive force, making the noise Mahan heard, and that particles of the fluffy cotton were blown through the meshes of the door, setting fire to the pile on the outside. It is extremely probable that the cotton inside the room was also burning.

(5) All of the cotton waste in the part of the factory where the fire originated was clean, dry, and free from oil or other extraneous matter. The pile of cotton outside the door was composed of bleached waste and fluffy particles of cop waste. The bleached waste was some left over from that used in making gun-cotton charge No. 173; it was received in bales over a year ago and found to be very clean, absorbent, and in hot weather remarkably free from firing in the process of dipping.

NAMES AND DUTIES OF EMPLOYÉS.

(6) The regular force employed in the gun-cotton factory numbered five men, but, as work had only just been resumed after a shut-down of some six weeks while repairs were made to the pulper, a vacancy that had occurred had not been filled, and four men only were at work at the time of the fire, engaged in running the pulper, picker, and final drier. They were J. Harrington, foreman; F. Loughlin, assistant foreman and engineer; and D. Mahan and L. Julienssen, first-class laborers. The first two mentioned had had long experience in the work of the factory, and were fully competent either to take part in or to direct the performance of any one of the processes. Harrington was made foreman in December, 1891; Julienssen was a new hand on trial.

(7) Upon the alarm of fire the duties were as follows: Harrington, in general charge, was to look after the northern half of the building, and he was specially charged, after sounding the alarm, to throw the tank of long-staple gun cotton out of the building, to turn on the sprinklers in the final drying room, and to see the fire hose led out and started. Loughlin was to look after the south end, to start the salt-water pump if it was not running, and to see that the fire hose in the center and south end were led out and started. The other hands were to lead out the hose near to which they happened to be working; in the event of fire making headway all were to pass out boxes of gun cotton (compressed). The fire apparatus was tested the 1st instant, and found to be in good working order; the fire hose and nozzles were always kept coupled and ready for instant use; the directions for fire could have been carried out under any circumstances in two or three minutes, yet when the fire broke out all hands seem to have precipitately abandoned the building, Harrington and Loughlin both coming over to the machine shop to notify me.

LOCALITY OF THE TANK CONTAINING LONG-STAPLE COTTON.

(8) There were some 6 or 7 pounds of long-staple gun cotton, made about a year ago for use in igniters and vent-sealing primers, stored loosely packed in an empty powder tank. This was kept adjacent to the north window in the room, be-

tween the engine and final press, used for the storage of the tanks containing the cotton ready for nitration. It was plainly marked, and both Harrington and Loughlin had been repeatedly cautioned by me as to the disposition to be made of it in case of fire, and it would almost seem as if they had recollected and were endeavoring to get it out when they were killed, for, instead of going down into the ditch, as I had ordered when directed by the inspector to concentrate all water on the boxes of wet gun cotton, they dragged the hose back from the north end of the factory, carried the nozzle to the window of the storage room and thrust it in. The explosion took place very shortly afterwards.

Very respectfully,

CHAS. BELKNAP,
Lieutenant-Commander, U. S. Navy.

Commander G. A. CONVERSE, U. S. Navy,
Inspector, in charge.

Referred to the "board of investigation," of which Lieut. Kennedy is senior member.

G. A. CONVERSE,
Commander U. S. Navy, commanding Torpedo Station.

Received July 11, 1893.

DUNCAN KENNEDY,
Lieutenant, U. S. Navy, Senior Member of Board.

Respectfully returned. Copy appended to the report of the board.

DUNCAN KENNEDY,
Lieutenant, U. S. Navy, Senior Member of Board.

D.

FIRE BILL.

The fire alarm will be a continuous ringing of the electric fire-alarm bell for the space of one minute. This will be followed by the steam whistles of the machine shop, ferry launch, and all boats under steam, sounding the general alarm thus: ———— – – – – ———— thrice repeated. The general signal will be followed by the signal denoting the fire district as given below.

The island is divided into three districts for the purpose of locating the fire.

First district.—All that part of the island north of a line joining the northeast corner of the gun-cotton factory and the southeast corner of the machine shop. Whistle signal, ——— –, ——— –, ——— –.

Second district.—All that part of the island lying between the above-mentioned line and a line running east and west at south end of the inspector's quarters. Whistle signal, ——— – –, ——— – –, ——— – –.

Third district.—All that part of the island south of the last-mentioned line. Whistle signal, ——— – – –, ——— – – –, ——— – – –.

On the alarm being sounded all the officers of the station will go to the district in which the fire is.

In the event of the fire taking place at or near the wharves, or on board any of the boats belonging to the station, the ferry launch will immediately spread fires and stand by to tow other boats out of danger.

On the first alarm being sounded all enlisted men will go to their stations as given below. A repetition of the alarm will call all the mechanics to the scene of the fire, except those at the gun-cotton factory, who will lead out their hose and protect that building and the magazines in the vicinity.

STATIONS.—*In charge:* Senior officer present. *Boilers:* Fireman on duty. *Steam pump:* Foreman of machine shop, *Triana's* machinist; at night, night watchman. *Hydrant and hose reel:* Assistant in charge of torpedo work; hydrant, mate in charge of grounds; at night, quartermaster, hose-reel, crew of *Fortune.* *Hook and ladder, wreckers:* The electrician, seamen under instruction.

T. F. JEWELL,
Commander, U. S. Navy, Inspector of Ordnance, in Charge.

E.

RULES FOR THE GUN-COTTON FACTORY.

(1) No person not specially employed there is to enter the gun-cotton factory unless accompanied by an officer.

(2) Mechanics engaged in repairs to the machinery and plant shall notify the foreman before going to work. The foreman shall see that all gun-cotton dust is removed from the locality before such work is begun; and he shall see that all waste, shavings, chips, and other refuse material and tools are removed from the building after the completion of the job.

(3) All soiled waste and refuse material of every kind must be placed in the crocks provided for the purpose and not dropped on the floors.

(4) The pulper, poachers, molding press, and surrounding areas spattered with gun-cotton pulp are to be washed down with the hose after the completion of the process for each charge; and particular care must be taken to prevent accumulation of refuse cotton waste or of gun-cotton pulp or dust in any part of the building.

(5) Pressed blocks are to be soaked as soon as practicable after stowing in boxes, and no dry gun cotton is to be stored in the factory except such samples as may be in the office.

(6) All caustic soda is to be kept in the cellar, and in weighing care must be taken that no particles adhere to the scales.

(7) Smoking is absolutely prohibited. No friction matches or other means of obtaining ignition are allowed in the factory.

(8) No lights other than the electric lights are permitted in the factory without the knowledge of the superintendent.

(9) The valves of the fire system of pipes are to be tested on the 1st and 15th of every month (when Sunday, the preceeding day), and the fire axes to be overhauled and freed from rust at the same time, and entry made in the journal of the condition of the fire apparatus.

(10) The steam fire pump is to be left in working order every night; the fire buckets are always to be kept filled with water, and the fire hose is to be kept coupled to the fire plugs and bighted down ready for use at a moment's notice.

(11) All windows and outside doors are to be fastened every night.

(12) Inside doors between the different parts of the building and, when there is any cotton in the pots, the roof windows of the dipping room are to be closed at night.

(13) In freezing weather all water pipes are to be bled each evening.

(14) Steam must be shut off the building completely every evening, except in freezing weather.

(15) Working clothes are to be hung in the place provided for them.

(16) The foreman is to inspect each evening before leaving, and to see that the factory is thoroughly cleaned up each Saturday afternoon. He is to see that the foregoing regulations are observed and to report any violation of them. Any infraction of the rules is sufficient ground for dismissal from employment.

THEO. F. JEWELL,
Commander, U. S. Navy, Inspector of Ordnance, in Charge.

TORPEDO STATION,
July 1, 1892.

F.

RULES FOR CONDUCT OF CREW AT GUN-COTTON FACTORY IN CASE OF FIRE.

(1) The efficiency of the electric fire alarm in the gun-cotton factory, also that between the gun-cotton factory and machine shop, and the efficiency of all fire-extinguishing apparatus in the building, will be tested by the foreman every morning, and their condition reported to the superintendent.

(2) Any person discovering fire will sound the nearest alarm and then promptly do everything in his power to extinguish it.

(3) Upon the alarm of fire the foreman will promptly go to its scene, take charge, in absence of the superintendent, and see that all the resources of the factory are employed well and effectively to extinguish it.

(4) Upon the alarm of fire the engineer will stop the engine, start the donkey pump, turn off the dry rooms and boiling tubs, and if the fire is in the middle or north end of the building he will turn the water on the dry rooms; he will then go to the salt-water pump, taking charge of it, under the foreman, starting it, if not

started, and turning the water on the fire line, doing his utmost to extinguish the fire.

(5) Upon the alarm of fire the person nearest the salt-water pump will start it and turn water on the fire lines; then utilizing the nearest hose and fire buckets will do his utmost to extinguish the fire.

(6) Upon the alarm of fire everyone will drop his work, leaving everything as safe as possible, and bring the nearest hose and fire buckets to bear effectively on the fire.

(7) Order and quiet will be preserved and the orders of the foreman promptly obeyed. Personal safety or consideration will be disregarded until the authority present consents.

(8) During the day, and under steam, the salt-water and donkey pumps must be kept charged.

(9) If the fire is at all serious, sound the machine-shop fire alarm.

(10) In case of serious fire, all gun cotton will be taken out of the building and beyond its reach. Pulp in stuff chest, poachers, and pulper will be run out through sewers.

No. 5.

OFFICE OF INSPECTOR OF ORDNANCE,
Hartford, Conn., September 13, 1893.

SIR: In obedience to the Bureau's orders I have the honor to submit the following report on the manufacture and inspection of ordnance material within the district under my charge for the year ending June 30, 1893:

The inspection in this district was in charge of Ensign H. H. Eames, U. S. Navy, up to January 14, 1893, when he was relieved by me.

At the commencement of the year the district embraced the following places of manufacture: Pratt & Whitney Company, Hartford, Conn., Hotchkiss rapid-fire guns; The William Cramp's Ship and Engine Building Company, Philadelphia, Pa., Driggs-Schroeder rapid-fire guns and Driggs projectiles; Winchester Repeating Arms Company, New Haven, Conn., large-caliber cartridge cases, Hotchkiss, and small-arm ammunition of all kinds; Union Metallic Cartridge Company, Bridgeport, Conn., Driggs and revolver ammunition; American Projectile Company, Lynn, Mass., steel-common shell, shrapnel, and A. P. shell up to 6 pounders; Colt's Patent Fire-arms Manufacturing Company, Hartford, Conn., revolvers and machine guns; Pratt & Cady, Hart ford, Conn., cast-iron shell; Simond's Rolling Machine Company Fitchburg, Mass., forgings for Driggs A.P. shell.

During the year the inspection at Philadelphia was, as a matter of convenience, transferred by the Bureau to an officer stationed in Washington, and as the projectiles for which steel was furnished by the Simonds Company were made at Philadelphia, the inspection at Fitchburg ceased to be under the control of this office.

During the year also there was added the inspection of material manufactured by the Hotchkiss Ordnance Company, at Providence, R. I.

This office is also charged with the inspection of arms at Ilion, N. Y., and equipments at New York City.

The following material remained to be delivered on July 1, 1892:

HOTCHKISS R. F. GUNS.

Heavy 1-pounders	27
6-pounders	83

DRIGGS R. F. GUNS.

Heavy 1-pounders	16
3-pounders	10
6-pounders	88

Accessories and spare parts for the above guns.

AMMUNITION.

3-pounder A. P. loaded rounds	6,504
3-pounder common loaded rounds	5,000
6-pounder A. P. loaded rounds	10,000
6-pounder common loaded rounds	4,000
1-pounder A. P. shell	8,601
1-pounder common shell	1,926
6-pounder A. P. shell	21,397
1-pounder cartridge cases (light)	5,800
1-pounder cartridge cases (heavy)	1,841
1-pounder wads	5,800
1-pounder drill cartridges	250
4-inch cartridge cases	11,019
5-inch cartridge cases	4,950
4-inch steel common shell	5,000
6-inch steel common shell	2,000

SMALL ARMS AND MISCELLANEOUS.

Lee magazine rifles and equipments	114
Colt's D. A. revolvers	36

One Gatling gun and electric motor.
One .32 caliber special rifle barrel.
One set of dies for reforming 4-inch and 5-inch cartridge cases.

The following material was ordered during the year:

HOTCHKISS R. F. GUNS.

Heavy 1-pounders (with accessories and spare parts)	29

AMMUNITION.

6-pounder cartridge cases, with fuses, etc., and making into loaded rounds, with shell furnished	20,000
3-pounder steel tubular common shell	100
6-pounder steel tubular common shell	100
1-pounder A. P. loaded rounds	50
1-pounder common loaded rounds	100
1-pounder drill cartridges	40
6-inch cartridge cases	3,000
4-inch cartridge cases	114
4-inch steel common shell	10,000
5-inch steel common shell	3,000
8-inch steel common shell	1,500
10-inch steel common shell	50
12-inch steel common shell	100
4-inch shrapnel	10
5-inch shrapnel	10
6-inch shrapnel	10
Time fuses	50

HOTCHKISS RAPID-FIRE MOUNTS.

1-pounder, hydraulic, with deck circles	29
1-pounder field carriages, complete	5
1-pounder limbers, complete	4
Spar deck circles for mounts	2

SMALL ARMS AND MISCELLANEOUS.

Lee magazine rifles and equipments	728
Canvass leggings, pairs	250

One .30 caliber special rifle barrel.
One set fuse thread gauges.
One set star gauge rings.

The deliveries and capacities of the various plants are as follows:

(*a*) Pratt & Whitney Company Hartford, Conn., subcontractors for the Hotchkiss Ordnance Company.

Inspected and delivered under orders for the Navy during the year:

Heavy 1-pounders	31
6-pounders	83
Spare parts and accessories for the above.	

In addition, at the request of the Hotchkiss Company the rapid-fire guns for the Revenue Marine were inspected and proof-fired in the same manner as those for the Navy. A number of spare parts to replace those damaged in service was also inspected and delivered.

This company is prepared to deliver guns up to 4 inches in caliber, although as yet none larger than 6-pounders have been made. For economy of manufacture the delivery of the comparatively small orders is necessarily slow, but with large orders and continuous running this plant has a capacity of about 150 6-pounders and 300 heavy 1-pounders (or 200 3-pounders) per annum.

With the exception of a few new fixtures and tools, no additions have been made to the plant during the year, but improvements in the methods of manufacture are gradually increasing the capacity.

The principal feature worthy of note has been the improvement in the design of the breech mechanism which has been approved by the Bureau, and embodied in the order for 25 heavy 1-pounders now being completed.

Although the improvements were originally intended to facilitate manufacture and eliminate the expense incident to the loss in the manufacture of certain parts, such as flat mainsprings and the firing pin, the design was incidentally also much improved.

The well-known tendency of screws to back out under vibrations has been overcome, as there are no screws in the new design. The maximum effort on the crank handle has been reduced by timing the cocking so as to take place before the block begins to move, thus also lessening the pressure on the crank head. Spiral main and sear springs and a very serviceable firing point have been introduced. The thread on the stop bolt has been abolished, and the method of fastening the rear sight on the gun by screws has been replaced by a convenient device so that the sight can be rapidly unshipped and shipped.

A very important change, made possible by the adoption of the new design, is the substitution of one spare article box in the place of the accessory and spare boxes of the former design.

All the parts, with the exception of the face plate, are now interchangeable.

At a recent trial of this design a heavy 1-pounder was unscrewed from the mount, replaced by another gun, the latter fired three times, all the parts changed, and three more shots fired in three minutes and thirty seconds.

The Pratt & Whitney Company has also during the past year supplied, under direct orders from the Department, a set of master gauges for the thread of fuses used in rapid-fire ammunition, and the various contractors supplying ammunition have made, or have had made, duplicates of these for working and inspection gauges, so that at present perfect interchangeability is assured.

A set of star gauge rings was also supplied, the facilities for accurate comparison guaranteeing the accuracy of the product.

(*b*) The William Cramp's Ship and Engine Building Company, subcontractors for the Driggs Ordnance Company.

Up to date of transfer of this inspection the deliveries from June 30, 1892, were as follows:

DRIGGS-SCHROEDER RAPID-FIRE GUNS.

6-pounders	17
Accessories and spare parts for the above.	

AMMUNITION.

6-pounder common shell	4,000
3-pounder common shell	5,000

The proving ground of this company being located on an island in the Delaware River, deliveries were somewhat delayed during the winter by the ice in the river, and a small accumulation of guns existed at the time of the transfer.

It was difficult to judge of the capacity of this plant, as the output was irregular and a portion of the plant was employed on 1 and 3 pounders, none of which had as yet been delivered. It is estimated, however, that with a slight increase of the plant, for the mechanism and accessories, about 225 6-pounders could be turned out per annum, although a rate of about 75 per annum only had been attained.

Work on the 3-pounders and 1-pounders had been commenced, but no model guns had been completed and submitted.

Two 3-pounders were shrunk in during February, and the work on the parts of the remaining guns on the order was well advanced.

Eight 1-pounders were ready for shrinking in and the remainder nearly so.

The dates of the orders for 1 and 3 pounders were September 6, 1890, and October 11, 1889, respectively.

The delay was due principally to the lack of a design of mechanism. An experimental 1-pounder had been finished, but after a private test by the contractors it was decided to again alter the design with the result that, at the time of transfer, no approved design for inspection existed.

During the year the attachment of pistol grips to the shoulder-bar was introduced and a slight difficulty was experienced in procuring a satisfactory lanyard therefor.

This resulted in the provisional adoption of a chain with steel links, which acted satisfactorily.

The approval of a new design of sear did away with necessity of a block support in assembling the 6-pounder breech mechanism, and at the request of the contractors the support was omitted from the accessories, the contractors agreeing to supply the first ten guns with pistol grips as a substitution for the omission.

Of the projectiles for Driggs R. F. ammunition, both common and armor-piercing, made at the works, only common shell had been delivered. The common shell are tested, and all kinds of Driggs ammunition are assembled at the works of the Union Metallic Cartridge Company at Bridgeport, Conn., and so far all the projectiles have shown excellent quality and workmanship.

During the year the remainder of the plant for the manufacture of common shell was transferred from the Pratt & Cady Company, at Hartford, but no opportunity offered of judging the capacity of the projectile plant as a whole.

(*c*) Winchester Repeating Arms Company.—Manufactured, inspected, and delivered during the year:

(1) Under direct orders from the Department:

4-inch cartridges	cases	11,132
5-inch cartridges	cases	4,473

1 .32 caliber experimental rifle barrel.
1 .30 caliber experimental rifle barrel.
1 set of dies for reforming 4-inch and 5-inch cartridge cases.

(2) Under subcontract for the Hotchkiss Ordnance Company:

1-pounder A. P. shell	3,900
1-pounder common shell	1,901
1-pounder cases, heavy	1,816
1-pounder cases, light	5,800
1-pounder wads	5,800
3-pounder A. P. loaded rounds	1,504
6-pounder A. P. loaded rounds	2,002
6-pounder A. P. shell	1,397

In addition to the above this company also supplies the rifle ammunition and is prepared to supply that for revolvers.

No special additions or alterations affecting the capacity of the plant for producing rapid-fire ammunition for calibers below 4 inches were made during the year, but it is believed that the experience gained leads to improved methods which result in a continuous slight increase of production.

The following is approximately the present maximum capacity of the plant per day:

1-pounder cases (light or heavy)	325
3-pounder cases	160
6-pounder cases	160
1-pounder common shell	300
1-pounder a. p. shell	200
3-pounder common shell	150
6-pounder common shell	200
6-pounder a. p. shell	125
1-pounder gas checks and inside fuses	90
3-pounder gas checks and inside fuses	90
6-pounder gas checks and inside fuses	70
Outside fuses	250
4-inch cases	50
5-inch cases	40
6-inch cases (estimated)	30
4, 5 and 6-inch primers and pockets	1,500
Primers for R. F. ammunition	3,000

With slight additions to the plant all the above ammunition for guns below 4-inches in caliber can be made and loaded at the same time.

If any two of the three kinds of cases (4, 5, and 6 inch) are made at the same time the output will be about one-half; if all, three—about one-fourth of the amount in the above table.

The manufacture of large cartridge cases has now passed beyond the experimental stage and this company is prepared to accept orders for all calibers up to 8 inches.

The order for 10,000 4-inch cases was dated July 18, 1890, and the last delivery was made March 14, 1893, showing the large average of over 300 per month. As evidence of development of the capacity of the plant, it may be stated that the deliveries of the last months of the contract averaged over 1,100 cases per month.

The production of 5-inch cases has been equally successful, the deliveries averaging over 900 per month since January; and after the commencement of the regular deliveries on these two orders, but one lot (100) of 4-inch cases failed to pass the required firing test.

A contract has been made with this company for 3,000 6-inch cases, and a second lot of 5,000 5-inch cases, which are to be supplied with electric primers. These primers will be of the same external dimensions as the percussion primers and interchangeable with the latter. An experimental lot will shortly be delivered.

The punches and dies for the 6-inch cases are nearing completion, and an experimental lot of 50 cases has nearly reached the heading stage.

In the inspection of these large cases the skeleton receiving gauge proved unsatisfactory, and has been replaced with satisfactory results, by a complete gauge similar to the gun chamber.

The manufacture and delivery of Hotchkiss ammunition are now, with the exception of 6-pounder armor-piercing shell, continuous and satisfactory. The difficulty in the manufacture of these shell is enhanced by the severity of the specifications, which require that the projectile shall pass through the plate not only whole but with an upset of not more than .25-inch.

These requirements have resulted in a very rigid inspection, on the part of the contractors, of the steel before beginning manufacture, and several lots were returned during the year that might otherwise have answered. Although this has caused occasional delays, the quality of the product amply repaid.

The additional consideration that a relaxation of the requirements would make it extremely difficult to judge between a poor projectile and a moderately good one, leads to the belief that no change in the specifications is advisable.

Owing to the difficulty of obtaining wrought-iron plates of the required dimensions, the Hotchkiss Company requested and obtained permission to substitute steel plates of a reduced thickness, but the expense incident to the necessary frequent renewal of the plate, due to its being broken instead of pierced, led to a return to wrought iron as the material for test plates.

The last delivery of built-up cartridge cases was made during the year, and future orders will be for solid drawn cases.

The action of fuses and primers has been highly satisfactory, less than one per cent of missfires having been observed with the latter.

In accordance with the Bureau's order all shell are now oiled on the outside instead of painted.

(*d*) Union Metallic Cartridge Company.—Under subcontract for the Driggs Ordnance Company there were inspected and delivered during the year:

6-pounder cartridge cases	4,000
3-pounder cartridge cases	5,000

Also fuses and primers for the above and loading with common shell furnished by the Driggs Company.

In addition, fuses and primers were manufactured and inspected sufficient to complete the remaining orders and nearly all cases necessary for the order of 5,000 3-pounder A. P., loaded rounds have been tested and accepted, and the assembling awaits the arrival of shell from Philadelphia.

Work on 6-pounder cases for outstanding orders has been begun and will keep well in advance of the arrival of projectiles.

This company also furnished, under direct orders from the Department, the revolver ammunition for the service and is prepared to furnish that for rifles.

Slight improvements both in the machines and the methods have been made during the year, and the capacity of the plant per day is approximately:

1-pounder cases (light or heavy)	250
3-pounder cases	80 to 90
6-pounder cases	80 to 90
6-pounder field cases	100
Fuses complete	200 to 250
Primers	2,500

With the exception of either the 3 or 6 pounder cases, all of the above can be manufactured at the same time, and additions are now being made by which the capacity of the plant will be nearly doubled.

The fuse springs assembled with fuses thus far delivered were made at Colt's factory, but machinery and fixtures for their manufacture have been installed by the Union Metallic Cartridge Company.

The difficulties attendant upon the proper tempering of these springs, resulting from their peculiar shape and requirements, have been successfully overcome by the subcontractors, and recent samples submitted have stood a test equivalent to a drop of 70 feet without breaking the spring or arming the fuse.

The primers made by this company are, as nearly as can be made, of the same sensitiveness as those made by the Winchester Arms Company, and the same small percentage of missfires has been observed.

(*e*) American Projectile Company.—The comparatively short existence of this plant, together with the large amount of experimental work done in developing the manufacture of various kinds and calibers of projectiles, has greatly limited the output.

During the year there were inspected and delivered:

4-inch common shell	5,000
6-inch common (experimental)	19
4-inch shrapnel (experimental)	10
5-inch shrapnel (experimental)	10
6-inch shrapnel (experimental)	10

Constant additions and improvements are being made in the forging, welding, and machining plants, and the contractors are now prepared to deliver steel common shell and shrapnel of any caliber, and armor-piercing shell up to 6-pounders. No opportunity has yet offered of judging the capacity of the plant as regards shrapnel, but for other projectiles is, per week, about as follows:

4-inch shell	250
5-inch shell	150
6-inch shell	100
6-pounder shell (A. P. or common)	300

The steel seamless tubing used, although supplied by only one firm, could be furnished in sufficient quantities to keep the plant running at its maximum capacity, but other tubing will be tried from time to time and new sources of supply thereby opened.

The first contract, dated February 4, 1891, with this company was for 5,000 4-inch steel common shell, and the first regular delivery was made September 14, 1892. The order was completed and the second contract begun during the year, the first proof lot being shipped on June 8, 1893.

All the shell of the design furnished by this company have hardened points and are fitted for base fuses; they are consequently common shells of large chamber capacity and moderate armor-piercing qualities.

The uniformity of the product due to the method of manufacture and the strict requirements in the inspection, warranted the Bureau in discontinuing the ballistic test of 4-inch shell after the delivery of the first 3,000, and all shells of this caliber are now delivered immediately after acceptance at the works.

Some difficulty and delay have been experienced in the manufacture of 6-inch shells owing to the irregularity of the tubing furnished. The original intention was to do no machining on the shell, but the irregular thickness and eccentricity of tubing of this size made a certain amount of machinery necessary, and the shell to be furnished will be almost entirely machine finished, and comparatively few forging marks will be visible. The quality of the tubing, however, is continually improving, and these shells will soon equal the 4-inch in uniformity.

Experiment and manufacture have developed the necessity of minor changes in the design for shell as regards the tolerances desired, and although a number of 5-inch shell have been finished, and an experimental lot tested, the contractors, warned by former experience, have decided to be guided by the average of a larger number in order to avoid subsequent changes in the design before submitting it for final approval.

Work has not yet been commenced on the larger calibers, but sample tubing for the 8-inch shell has been ordered.

The successful production of armor-piercing projectiles, with any method, is a matter of time and experience, and in the case of this company the difficulties have been enhanced by the novelty of the method used for making the head and base separate and electrically welding the two. One official and several contractor's tests have taken place, but although all the projectiles penetrated the plate, about 25 per cent broke in or near the weld and band score. Investigation showed various causes, such as slight nonuniformity in the weld, insufficiently annealed copper in the bands, oblique impact, etc., but nearly all have been overcome, and a successful test is soon expected. A hydraulic test was introduced to detect imperfect welds, and this, together with experience gained in visual inspections, has resulted in the weeding out of all but apparently perfect welds, and this operation is now as good as the state of the art admits.

The number of experimental small caliber common shell is being made by this company. These shell will be hardened by the Harvey process, and it is believed a cheap shell can be produced by this method that will closely approach the armor piercing projectiles in penetration.

A new design of shrapnel of a simple and effective character was submitted during the year, and a small number of experimental ones was made and delivered. The design is that of Lieut. W. M. Wood, U. S. Navy, but it is now owned by the company. Aside from cheapening the manufacture the distribution of the bullets and bursting charge throughout the entire length of the shell would seem to improve the character of the burst, and the action of the experimental shrapnel delivered and tested verified this belief.

In order to perfect their action, the designs were in some instances altered to increase the powder capacity, and it is believed the sharpnel that will be supplied on the contract now pending will be of exceptionally effective quality.

A design of time fuse, similar to that in use in the Army, with the omission of the percussion element, is being made by the contractors. Experiments with the time train are in progress, and the delivery of an experimental lot will shortly take place.

The character of the product of this plant is such that a great deal of floor space is required, and in order to prevent accumulation and expedite deliveries, the number in the lots of 6-inch shell has been reduced from 500 to 250.

The power hitherto used has been supplied by an adjoining plant, but the company has installed a power plant of its own, and night work is now carried on.

(*f*) Colt's Patent Fire Arms Manufacturing Company:

The orders for this company during the year were limited to revolvers of which 36 were delivered to the New York and 35 to the Texas naval militia.

This company, as subcontractors, also manufactures Gatling machine guns. The capacity of the plant is about:

Naval revolvers, per month	1,200
Gatling guns (present model) per month	4 to 6

The work of the Gatling Gun Company on the sample gun with motor attachment has, pending the change of caliber, been confined principally to the development of a new feed. This feed is absolutely positive and is such that the speed of fire is now only dependent upon the rapidity with which the mechanism can be worked. It is in the nature of a feed-belt, the belt being of tin and sufficiently rigid to prevent difficulty of handling. The feed is to be supplied with the model gun being made, and, as the result of a trial at the National Armory at Springfield, is to be embodied in the guns now being made for the Army.

The motor is being made by the Eddy Electric Manufacturing Company, of Windsor, Conn., and is nearing completion. The principal features aimed at have been instantaneous commencement and cessation of fire, and capability of rapid change to and from hand power. These have been accomplished by the introduction of a clutch on the main shaft, and by an electric plunger the shifting is made automatic. The motor is contained in a cylindrical case of the same diameter as the body of the gun, and is practically an extension of the breech. The mechanical details are now being developed and an official trial with a .45-caliber gun with the new feed attachment will soon take place.

(*g*) Hotchkiss Ordnance Company, Providence, R. I.

This plant was originally established for the manufacture of torpedoes, but the manufacture of minor ordnance details was gradually introduced, until the subsidiary plant had reached such proportions that an additional shop was found necessary. One was therefore leased about the latter part of April and a new plant installed. This shop has been in running order for several months, and the contractors are now prepared to supply ordnance material of all kinds.

The deliveries up to July 1 were as follows:

Drill cartridges	290
1-pounder field carriage, complete	5
1-pounder limbers, complete	4
1-pounder hydraulic top carriage	1
1-pounder cage stands	4
1-pounder deck circles	5

Nearly all the above material was consigned to the naval militia of various States, but deliveries on the regular orders for the service will soon be begun.

A complete set of new gauges for 1-pounder hydraulic mounts was made and compared, and with the addition of a few more machines the capacity of the plant for these mounts will be about 10 per month.

The mounts as made are, with the exception of a few minor details, the same as the mounts now in service, and steps have been taken to secure interchangeability of all similar parts.

The cage stands and deck circles are of cast steel, and, although amply strong, the castings have the usual imperfections and rough appearance due to sand holes and shrinkage, resulting in the rejection of a number, both by the contractors and the inspector. The contractors have, however, taken unusual steps to remedy as far as possible these imperfections, and the mounts so far delivered have been excellent, both in quality and appearance.

The field outfits supplied by this company have not yet been adopted regularly. Those furnished were inspected principally for material and completeness of detail. One carriage was tried under approximately service conditions on a moderately rough road, and with the exception of excessive weight, was found up to standard. The strain on the elevating arc and screw is, however, too great when the gun and carriage are being hauled over rough roads, and an additional strap clamp will be introduced in future designs.

The use of the hydraulic recoil mount and the spade shoe on the trail have so much diminished the recoil of the carriage that wheel brakes have been found unnecessary and were not supplied with these mounts.

(*h*) Pratt & Cady Co.

With the delivery of the 3,500 1-pounder common shell, the remaining orders of this company were completed; and, as stated above, the transfer of the plant to Cramp's works took place.

(*k*) General.

During the year rapid-fire guns, mounts, field outfits, revolvers, rifles, ammunition, and equipments, including bayonets, scabbards, belts and leggings, were inspected and delivered for the naval militia of various States as follows: New York, Massachusetts, Rhode Island, California, North Carolina, South Carolina, and Texas.

As nearly all the parts of the rifles delivered had previously undergone detail inspection, a stand inspection alone was made, and only a small number at random was inspected in detail.

The equipments furnished by J. W. Frazier, agent of the Lee Arms Company, at New York, and were in all respects up to standard.

The capacities of the plants as given are the maximum ones for ordinary hours of labor only; with night work about 75 per cent would be added.

The training and experience gained by the manufacturers and workmen by the development of the various plants has opened up valuable and reliable sources of supply to the Government, and it is believed that should the necessity arise all their capacities could be increased and new ones established for the minor details without great loss of time.

The character of the work submitted for inspection verifies the reputation for excellence held by New England manufactories, and this, together with a disposition to aid in overcoming difficulties not strictly required by the contract or specifications, and the facilities offered the inspectors, has led to the production of war material superior to any yet seen.

Hesitation to accept new orders was expressed by some of the subcontractors, owing to the impossibility of distributing their work to comply with the eight-hour law, but upon being convinced by legal opinions that ordnance material did not come under "public works" in the application of the law, their hesitation vanished.

Recent disturbances in financial and labor circles led to retrenchments, which resulted in some instances in slight delay in deliveries, but former conditions are gradually being restored.

Including the time that the present incumbent was acting as assistant inspector, the expenses incident to the inspection for the year have been about as follows:

Pay of inspector (ensign on other duty), fifteen months	$1,500
Traveling expenses of inspector	1,200
Pay of subinspectors and helpers	3,742
Repair of typewriter	35
Miscellaneous	140
Total	6,617

This office has availed itself of the facilities offered for observing the results of new manufactures and experiments made by contractors and inventors, and not directly connected with the inspection. Reports have from time to time been forwarded, and the following is a summary of these results, together with the principles governing the reports:

Rapid-fire guns.—Aside from the improvements and changes in the Hotchkiss system, the principal feature has been the completion and trial of the Sponsel gun.

The admissible systems of rapid-fire mechanism may fundamentally be classed as elaborations of the two types—the sliding wedge and the interrupted screw, both of which have advocates of equal authority.

Certain features, such as safety, certainty of action, and ease of loading, are so essential that the lack of any one of these in a gun bars it at once from further consideration. The other requisites may be stated in detail to be rapidity of manipulation and ease and rapidity with which damaged parts may be replaced.

In the selection of war material it is believed the consideration of cost, within reasonable limits, should enter only when other essential features are equal, or nearly so, and as this is almost a direct factor of the simplicity of a design, it is seen that the superiority of any system over others depends upon the simplicity of its elaboration of either of the types cited. The limit of simplicity as regards the number of parts has, with existing types, nearly reached a minium, and further improvements on the present lines will be competitive merely in ingenuity.

The Sponsel system is of the vertical sliding-wedge type, with open-top housing, the top of the block when the breech is open forming a trough, which facilitates loading. The peculiar feature of the system is that the entire mechanism is contained in the block, which permits rapid change of parts, and change of complete block may even become permissible by reason of cheapness, thus still further decreasing the time that the gun will remain out of action.

The only gun thus far made is a 1-pounder, and trials are reported as satisfactory.

In the consideration of the advisability of the adoption of a new system embodying peculiar features, the adaptability of the design to all the calibers for which it will be required should have great weight. Whether the Sponsel gun possesses this adaptability will be seen when the 6-pounder now being made on the same design is tried.

The prevalence of hang fires with smokeless powders has caused the attention of inventors, both here and abroad, to be directed to designs for the prevention of accidents from this cause, pending the remedy in the ammunition itself. The designs consist mainly in the application of one element of the automatic principle, by which the block is locked until the recoil due to discharge has taken place.

Abroad, the automatic principle has been carried to the extent of performing, by the force of recoil, all the operations except those of inserting the cartridge and pulling the trigger.

The question of sights has received some little attention, principally as regards the form of notch. The most favorable among these is one which is claimed to possess the merit of assisting in bringing the eye quickly into the notch. The form is that of a cone with its axis in the line of sight and the apex to the front, the portion of the cone above a horizontal plane through the axis being cut away. To further assist the eye, annular strips of white metal are inlaid transversely on the interior face, the body of the cone being dark.

A desirable sight for a rapid-fire gun would be one capable of being worked by one hand and very quickly set at any elevation, with the marks in view at all times above and below the origin. Such a sight has been devised and the patents applied for. The slow action of the rack and pinion has been abolished, and by a small fraction of a turn of the clamp the sight bar is released or clamped. The successful action of the sight will be determined when a model has been made.

Machine guns.—The attempts at the application of the automatic principle have been directed more to the machine gun than any other, and with varying success both here and abroad. In the development of the principle two forces are employed, the force recoil and the force of the escaping powder gas.

The attempt to use more than one barrel results, however, in an undesirable increase in complication (already great in guns operated by the force of recoil), and automatic machine guns are now generally made with only one barrel. The disadvantages of this design are reduction of speed of fire and danger of disablement of gun by the wearing out of the barrel. The advantages are lightness and simplicity.

The wearing of the single barrel in contrast with those of the multiple barreled guns becomes important in the former only when the speed of fire exceeds the average speed per barrel in the latter, and when by the character of the design the barrel can not easily be replaced.

The speed of fire in automatic guns of the different designs carries from 200 to 500 shots per minute, and this is not deemed excessive when compared with the rate of from 1,200 to 3,000 shots per minute in a ten-barreled gun.

There are three principal uses of machine guns in the Navy—on board ship, in boats, and on shore; and the inadvisability of the introduction of different systems is believed to lose in importance where the uses of the arm are so different, provided the systems introduced possess peculiar advantages specially adapted to these uses.

Automatic action has been approached with the Gatling gun by the attachment of an electric motor, but one of the principal advantages of the purely automatic action, namely freedom from danger due to hang-fires, does not obtain. The correction of this, however, is believed to lie in the improvement of the ammunition.

An automatic machine gun, which embodies the main principles desirable in a gun for use in boats or on shore, was recently tried and reported upon by me. It is known as Colt's automatic gun, and has but one barrel. It is operated by the force of the powder gases, weighs about 32 pounds, and has a maximum speed of fire of about 400 shots per minute. The mobility resulting from the fact that it can be easily transported and operated by one man is very advantageous.

The problem of continuous feed seems to have been solved by application of the belt or a similar feed, and at a recent trial with dummies with the new Gatling feed a rate of nearly 3,000 shots per minute was attained.

Small arms.—Continuing in accordance with instructions given my predecessor by the Bureau, and in view of the probable change of naval arm, special attention has been paid to the subject of small arms.

In the consideration of a small arm the comparatively independent character of the three features, caliber, magazine, and breech mechanism, permits investigations of these features separately.

From investigations both theoretical and practical, and from the results of experiments both here and abroad, a reduction of caliber is deemed inevitable.

The ideal arm, considered ballistically, is one the path of whose projectile is a straight line, the axis of the bore indefinitely prolonged; capable of great penetration, and the weight of whose ammunition is inconsiderable and recoil a minimum.

The advantages of a reduction of caliber are:

(1) The use to the best advantage of smokeless powder.

(2) Reduction in weight of ammunition, and consequent increase of supply for the same weight.

(3) Increased velocity, effective range, flatness of trajectory, dangerous space, and penetration.

(4) Reduction of the time of flight and consequently increased accuracy both at stationary and moving targets.

(5) The weight of the gun remaining the same, or nearly so, the recoil is diminished and accuracy promoted; besides conducing to the endurance and comfort of the soldier.

The disadvantages are:

(1) Increased pressure and consequently greater strength of barrel required.

(2) Increased difficulty in manufacture, both of gun and ammunition.

(3) Increased expense of gun and ammunition.

(4) Difficulty of obtaining a suitable powder.

(5) Decreased shock or stopping effect of the bullet.

It is worthy of note that the advantages are all purely tactical and the disadvantages almost all mechanical.

The theoretical proofs of the advantages have been borne out by actual results with calibers as low as six millimeters, and the mechanical disadvantages have been overcome. There therefore only remain the expense and the question of shock. Opinions on the former have been expressed under rapid-fire guns. In regard to the latter, opinions are contradictory, but it is believed that the disadvantages would only be greatly noticeable in flesh wounds in the limbs.

The question of the stopping effect in the defense against a cavalry attack need not be considered in view of present tactics, and the fact that a satisfactory solution would mean either an increase or at least the retention of the present caliber.

The important difficulty of obtaining a suitable powder is being vigorously investigated, both at home and abroad; but pending its solution present powders are being used with fair success.

It is seen, therefore, that the advantages being proved, and the disadvantages overcome, the ideal arm is approached by a reduction of caliber.

Theoretical investigations have been carried to calibers as low as 3 millimeters (0.119 inch), but the limit of reduction can only be found by practical experiments.

Experiments in drilling and rifling small-bore barrels have been made, both in ordinary and nickel steel, by the Winchester Arms Company and the Pratt & Whitney Company.

The advantages of the peculiar properties of nickel steel make the results of these experiments valuable, and it is believed that the difficulty of working this metal will be overcome, and its most important property (anti-rusting) brought into use.

The question of the character of the magazine to be used is purely practical, and its investigation should be based upon the nature of the service required and the character and intelligence of the man to use the arm.

If it is conceded that a magazine is to be attached at all, the question of using the gun as a single loader should only have weight to the extent that the gun should be capable of being used as such when the magazine is disabled or the loading packs exhausted.

The soldier should be burdened with as little thought as possible in regard to the manipulation of his weapon, and the introduction of a cut-off is deemed an unnecessary complication both tactically and mechanically. The pack should be considered as the unit, and attempts to control fire should be based upon this consideration, especially since the facility with which a pack may be inserted is nearly the same as with a single cartridge.

The soldier who, either from excitement or laziness, would avail himself of the magazine supply to the detriment of economy of ammunition would throw off the cut-off; and detection, especially on an extended skirmish line, would be nearly impossible, however prominent the cut-off. At the critical moment, therefore, his magazine in reserve would be found empty; or in the excitement remembering his cut-off, he would be very likely to throw it on.

The repeater is therefore believed to be the proper system, and economy of ammunition should be fostered by instructions in the intelligent use of the weapon.

In the consideration of the breech mechanism it is difficult to lay down any but the most general rules, as the perfection of mechanical details frequently overcomes slight inferiorities in a system.

The ideal arm would be one which, when at the shoulder and aimed, could be fired repeatedly by a simple touch of the trigger without disturbing the aim, and without fatiguing operations of loading, or lowering or raising the gun.

This ideal is approached very closely by the automatic gun, but this is barred from consideration by numerous objections, principal among which is that the discharge approaches a volley and it is almost impossible to fire one shot at a time.

The nearest practical approach is reached with straight pull bolts, and two systems of this type were submitted among others to the Army Magazine Gun Board. These systems possessed more or less merit but were rejected by the board as unsuited to military service. It is believed, therefore, that the selection of a suitable system can only be satisfactorily made by a trial of the different inventions.

Revolvers.—The present design of Navy double-acting revolver, as far as shape and balance are concerned, is deemed equal to any, but the defect in the design which admits of locking the cylinder and aligning it with the barrel only at the instant of fire is worthy of consideration. Aside from the fact that the cylinder may be revolved either intentionally or by accident, with the hammer rebounded, the small latitude allowed for wear and tear in service is likely to result in shaving the bullet, or in miss-fires, both of which are conducive to inaccuracy of shooting. That this is so is evidenced by rumors heard, but no cases have yet been brought to the notice of this office officially.

A desirable feature conducive to accuracy has been observed in certain double-acting revolvers by which a slight pause is made by the hammer when about to descend. During the pause the pull becomes perceptibly lighter and a light click is heard; the marksman is thus notified and aim can be rectified.

The embodiment of this feature and the alteration remedying the cylinder alignment in the service revolver are earnestly recommended.

Ammunition.—The improvements in ammunition for rapid-fire guns have been principally in the material used for cartridge cases and projectiles. Attempts have been made from time to time to replace brass as the material for large cases, but with questionable success. Among the materials experimented with are wood or paper pulp and aluminium, but practical results have been attained with the latter only. The only advantage, however, that of lightness, is far outweighed by the disadvantages of expense and the difficulty of working the metal.

The use of steel tubing and the application of electric welding have cheapened the manufacture of steel shell and it is probable that cast-iron shell will be replaced entirely as the material for common shell for rapid-fire guns.

By the introduction of the small caliber and smokeless powder an entire revolution in the manufacture of small-arm ammunition has taken place, and experiments with the various details are continually in progress.

The ammunition manufactories in this district have taken the matter up and practical results have been attained. The most serious difficulty thus far encountered has been that of hang-fires due to the difficulty of igniting smokeless powder. The difficulty is enhanced by the fact that the actions of the various powders are different, but both the Winchester Repeating Arms Company and the Union Metallic Cartridge Company have succeeded in producing primers that are very prompt in their action.

The difficulty in detecting short hang-fires was overcome by the use of the Gatling gun.

The cheapness, elasticity, strength, and antirusting properties possessed by nickel steel will, it is believed, bring this metal into competition with brass as the material for cartridge cases, and experiments are shortly to be made.

The above plants are not yet fitted for the complete production of small-caliber ammunition with jacketed bullets, but with several months' notice it is estimated that 100,000 per day could be delivered.

Various kinds of smokeless powders have been experimented with, principally with a view to introducing it in sporting ammunition.

Through the kindness of manufacturers and inventors, samples of rifleite, cannonite, apyrite, and others have been obtained by this office, and, by direction of the Bureau, forwarded to the torpedo station.

Equipments and miscellaneous.—Various improvements in belts and apparatus for carrying ammunition, knapsacks, or other packs, with a medium strain on the soldier have been produced, but their adaptability depends in a great measure upon the system of arm and the character of the loading pack used.

A convenient and serviceable intrenching tool has been designed by Lieut. G. E. Albee, U. S. Army, retired, which, by its ingenious attachment to the stock of the rifle, does away with the inconvenience of carrying it on the person.

Very respectfully,

A. C. DIEFFENBACH,
Ensign, U. S. Navy, Inspector of Ordnance.

OFFICE OF INSPECTOR OF ORDNANCE,
DRIGGS ORDNANCE COMPANY,
October 1, 1893.

SIR: I have the honor to submit the following report of the work done under my inspection by the Driggs Ordnance Company on guns and ammunition at the Cramp's Gun Works.

Since the date of the transfer of the inspection to me (March 8, 1893), the following guns and ammunition have been finally tested, accepted, and delivered:

Twenty 6-pounder R. F. guns.
Ten 3-pounder R. F. guns.
Five 1-pounder R. F guns have been completed, but not yet formally accepted, awaiting the special test prescribed for the first gun of this caliber.
Five thousand armor-piercing 1-pounder projectiles, and
Three thousand armor-piercing 3-pounder projectiles.
In addition, three thousand 3-pounder common shell have been machined and sent to the Union Metallic Cartridge Company for assembling into ammunition.

All armor-piercing projectiles tested ballistically have passed without the slightest difficulty, and I believe that the tests could be made more severe without increasing the cost under new contracts.

With each lot of armor-piercing projectiles there was tried a half lot of fuses. It is noted that the explosion of the shell takes place at about 18″ from the oak target with 3-pounder, and at about 12″ with 1-pounders. The results were very uniform throughout the tests.

The work done by the company has been carefully inspected at all stages, and it is satisfactory to report that the contractors and their officials and workmen seem desirous at all times of producing the best work possible.

Very respectfully,

A. R. COUDEN,
Lieutenant Commander, U. S. Navy, Inspector of Ordnance.

The CHIEF OF BUREAU OF ORDNANCE,
Navy Department.

No. 6.

NAVAL PROVING GROUND,
Indian Head, Md., June 15, 1893.

SIR: Upon my detachment from duty as inspector of ordnance in charge of this station I have the honor to submit the following report of work done since October 1, 1892:

Progress of station.—The cutting away of the hills and the grading of the valley have been completed. The firing ground is now quite level and the excavations in the hillsides for batteries, butts, boiler house, etc., are large enough for all practical purposes. A dam has been built across the valley about a quarter of a mile above the firing ground to retain the great volume of water which comes down the watersheds after heavy rains. This water, in the past, delivered over the valley, cutting out banks and small structures and greatly increasing the mud on the firing ground. By means of the sluice gate in the dam a stream of constant volume is allowed to flow to the river; there is no more flooding and no formation of swampy ground and growth of swamp vegetation. I attribute the excellent health enjoyed by all at the station to the good drainage systems now obtaining. Before occupation by the Government this property was uninhabitable for any length of time owing to the prevalence of malarial fever. Not a single case of this has occurred within the past two and a half years.

The lake formed above the dam will furnish the water supply for the machine shop, boiler, and fire pump.

A tramway has been completed from the firing ground to the magazine, with a branch to the machine shop, storehouse, and filling house. Material can now be loaded from a vessel on cars and run to its destination without double handling. This railroad has more than paid for itself in saving time and labor in hauling by carts and teams.

A substantial breakwater has been built of timber, behind which the boats belonging to the station can be protected from the northwest winds and from ice. It was entirely due to the presence of this structure that the whole wharf, derrick, and appurtenances were not completely destroyed by the heavy ice of last winter. This breakwater needs further strengthening by driving 6-inch sheet piling between the main piling.

Two parks, of three sections each, have been built—one for guns and carriages and the other for plates and backings when not in actual use. A section of track for the traveling crane has been constructed along the north side of the valley, enabling the crane to carry plates to the farthest butt.

The second butt is practically finished. All roof and side plates are in place, but two bottom plates have yet to be received from the navy-yard. Repairs have been commenced on butt No. 1, into which all calibers have been fired for the past two years. It is but little damaged and shows beyond question the advantages of the system.

The steel target structure designed by the Bureau has been erected and three plates have been tested on it. It was not strong enough to resist successfully the energy of 10-inch shell and has been completely wrecked.

The main bombproof at the velocity battery, originally built of wood, has been rebuilt permanently in brick. Retaining walls of brick for sloping banks have been put up as time and appropriations would allow.

The new brick boiler and engine house has been completed, except painting. An excellent upright boiler has been installed and is now in use for working the large pump of the hydraulic plant. The old horizontal boiler can now be held in reserve, and will be valuable for heating the station in winter. The new engine for the shop has been required for but has not yet been received. The installation of the lathes and planers in the shop at an early date is very desirable. A great amount of indispensable work has been done by turning these machines by hand, but the time factor in these jobs is too large.

The hydraulic system continues to give satisfaction, except in cold weather, and no changes are recommended beyond the erection of the accumulator, which is now at the station.

The electric circuits in the neighborhood of the firing ground have been run below the surface in boxes, and are out of danger from flying fragments. The chronographs and batteries when properly cared for have given thorough satisfaction.

The instruments have been inclosed in handsome cedar cabinets to protect them from dust.

The entire velocimetric system is now complete.

Slight repairs, as required, have been made on the various buildings of the station. A house for paints and oils and a magazine for high explosives have been erected.

Roads and fences have been built where necessary. The provender for the stock has been raised on the north farm.

Proof of guns.—The following guns have been given the full proof for service: Four-inch R. F. G., Nos. 9, 10, 12, 13, 15, 16, 17, 18, 19, 20, 24, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, and 39; 5-inch R. F. G., Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 3; 6-inch B. L. R., 124, 125, 129, 130, and 131, and 6-inch wire wound; 6-inch quick fire, No. 132; 10-inch B. L. R., Nos. 9, 10, 15, 17, 18, 19, and 20; 12-inch B. L. R., No. 4, and one 10-pounder Hotchkiss field gun. There was no failure in any particular of guns in proof.

The breech mechanism adopted for rapid-fire cannon continues to be thoroughly satisfactory.

The breech mechanism for the heavier guns works well. It is powerful and quick in its action. It could be much improved by making the slots or blanks on the screw plug four or five in number instead of three, as at present.

The firing lock is thoroughly unsatisfactory and dangerous to persons immediately in rear of the gun.

A set of sights for the conning towers over the 8-inch turrets of the *New York* has been designed at the station and tested. It consists of a front sight on the turret roof and a rear sight connected with the breech of the gun by a swinging bar. It works very well. Using these sights, set up on a wood scaffolding over the gun, three shots were fired through the same hole in a board target 200 yards distant.

The Grenfel system of night sights has been tried and found to be efficient, provided a light or some illuminated part of the enemy be visible upon which the sights can be directed.

Gun mounts.—Hydraulic mount Mark II, for the 12-inch guns of the *Puritan* is under trial. It has been tested with full charges at all elevations and has been found to work well.

Hydraulic mounts Nos. 7 and 8, Mark III, for the 10-inch guns of the the *Maine* have been thoroughly tested as far as the proving ground mountings will allow. These mounts have an independent hydraulic recoil cylinder, with hydraulic motors for running the gun in and out, elevating, etc. In my opinion, this is the best mount in principle that has yet been tested. The independent recoil cylinder is a great advantage, making the firing of the gun possible even when the hydraulic gear is broken down or out of order. With slight alterations the mount is capable of being worked by hand. The application of alternate hand power to hydraulic mounts must be regarded as a necessity. My experience of the last five years with these mounts has thoroughly confirmed my belief that no hydraulic mount should be put on shipboard unless it be provided with hand power for an alternate.

To make hand power rapid enough to be efficient, changes in design will undoubtedly be needed in future mounts, such as the construction of guns with trunnions to permit of quick elevating, the use of gravity or spring return cartridges, etc., but the experience of the past winter at this station has clearly shown that a fairly efficient hand-power arrangement can be applied to mounts already constructed of Mark III type. During cold weather and for months the routine firing with the 10-inch guns was kept up, using hand power when all hydraulics were frozen solid and at times when it was inconvenient to get up steam in the system. All the details have been fully and frequently reported upon to the Bureau, but I would once more respectfully call to your attention the great importance of the subject, especially as viewed in the light of the state of the art we have reached in the general system of hydraulic fittings.

The twin mounts for the *New York's* 8-inch guns were tested and worked admirably. Both guns fired simultaneously produced no undue strain or vibration of any part.

The 5-inch and 4-inch rapid-fire gun mounts have been fully reported upon in detail. The new type of 4-inch mount has given most gratifying results in accuracy and rapidity of fire.

Proof of powder.—Powder for every caliber has been tested, with varying success. All lots recommended for issue to service have been fully up to standard.

Test of projectiles.—Specimen shell from each lot of armor-piercing shell manufactured under contract for the service have been tested. Nearly all behaved well and passed the lots represented. Tests have also been made in acceptance of 4-inch and 5-inch steel common shell from the American Projectile Company and United States Projectile Company. These shell can carry their bursting charges through half a caliber of steel at 1,500 yards. At close range the 4-inch electrically welded shell with Harveyized surface will carry its bursting charge through a hard 3-inch steel deck plate, exploding 2 or 3 feet beyond the plate. These shell are specially efficient when filled with the high explosive bursting charge. The explosion is of a very high order, probably a detonation, and its destructive effects are most marked. An untreated shell will generally explode on the front of or while passing through the plate.

Ten-inch and 12-inch steel common shell, manufactured by the Taylor Iron and Steel Company, of High Bridge, N. J., have been tried, with satisfactory results.

Two 10-inch solid steel shot, from Isaac G. Johnson & Son, Spuyten Duyvil, N. Y., were fired against a 10-inch nickel-steel plate. One shell passed through plate and backing, breaking in two; the other assumed a mushroom shape upon impact and failed to penetrate.

Shrapnel for the 4-inch and 5-inch calibers, made by the American Projectile Company, have been tried. They break up well in the explosion chamber, and when fired through thin plating the dispersion of balls and fragments is very good.

Considerable firing, with varying results, has been done with small armor-piercing shell of experimental temper conditions.

Trials of shell fitted with rotating bands of fiber-graphite have demonstrated the worthlessness of this material for this purpose.

Proof of cartridge cases.—Cases for the 4-inch and 5-inch rapid-fire guns have been tested for acceptance as submitted. Considerable difficulty was found with the first lot of 5-inch cases in preventing the case swelling just forward of the head. This difficulty was overcome by making the metal much thinner at this point than originally designed. The 5-inch cases as a rule behave better than the 4-inch as far as sticking is concerned, and there seems to be every prospect for the success of the 6-inch cases in the near future.

Range work.—The 5-inch rapid-fire gun and the 6-pounder and 1-pounder subcalibers have been ranged. The excellent work of triangulation of the range by Ensigns Dieffenbach and Rust and the chart prepared by these officers are found to be all that is required for the determination of ranges and deflections.

Armor tests.—A 14-inch nickel-steel plate from the Bethlehem Iron Company, representing the diagonal armor of the *Massachusetts*, was tested for premium with the 10-inch gun and striking velocity of 1,604 foot seconds. The plate failed to win a premium, but passed successfully the acceptance tests of three rounds with striking velocity of 1,380 foot seconds.

A 10-inch nickel-steel plate, from Carnegie, Phipps & Co., representing the barbette armor of the *New York*, successfully passed the acceptance test with three rounds from the 8-inch gun, and striking velocities of 1,410 foot seconds. The plate was not cracked until the third shot.

A 14-inch nickel-steel plate, from the Bethlehem Iron Company, representing the diagonal armor of the *Oregon*, passed the acceptance test of three rounds from the 10-inch gun with striking velocities of 1,381 foot seconds.

A 14-inch nickel-steel plate, from Carnegie, Phipps & Co., representing the casemate armor of the *Oregon*, was tested with the 4-inch gun for premium, under the new specifications. The plate failed to win a premium, but passed successfully the test for acceptance.

A 4-inch nickel-steel plate, from Carnegie, Phipps & Co., representing the side armor of the *New York*, successfully passed the test for premium with the 4-inch gun under both old and new specifications.

A 4-inch nickel-steel plate, from Carnegie, Phipps & Co., representing the casement armor of the *Massachusetts*, failed to win the premium, but passed successfully the acceptance test with the 4-inch gun.

An 8-inch nickel-steel curved plate, from Carnegie, Phipps & Co., representing the turret armor of the *Monterey*, failed to win a premium, but passed successfully the test for acceptance with the 6-inch gun.

A 9-inch nickel-steel plate, from Carnegie, Phipps & Co., representing the side armor of the *Amphitrite*, passed successfully the test for premium with the 8-inch gun.

Preparations are well advanced for the installation for test of a 11-inch plate representing the side armor of the *Monadnock* and a 17-inch plate representing the barbette armor of the *Indiana*. These plates will be tested with the 8-inch and 12-inch guns respectively.

Two most interesting experimental plates have been tested—a 10.5-inch curved nickel-steel plate, Harveyed, against which the 8-inch gun was fired, and a 14-inch nickel-steel plate, Harveyed, attacked with the 10-inch gun. The successful manufacture of the curved plate settled the question of the application of the Harvey process to plates for turrets or warped surfaces. This plate resisted successfully four 8-inch Holtzer and Carpenter shells, one with 1,800 foot seconds and three with 1,900 foot seconds striking velocities. All the projectiles were smashed on the plate, penetrating not more than 3 inches or 4 inches. The plate was badly cracked, but the backing and structure were uninjured by the impacts of the shell.

The test of the 14-inch Harveyed plate was unquestionably the most important armor trial that has ever taken place. This plate was attacked with four 10-inch Holtzer shell with striking velocities of 1,472 foot-seconds, 1,859 foot-seconds, 1,959 foot-seconds, and 2,059 foot-seconds. All projectiles were smashed on the plate, the greatest penetration being about 11 inches in the last round, which round was directed at a fragment of the plate weighing but 4.4 tons, and with a striking energy of 14,715 feet-tons or 3,344 feet-tons per ton of plate attacked. Such energies per ton of plate have never even been approached in former tests at home or abroad. The plate was mounted on the same structure as has been used before and after for the test of ordinary 14-inch nickel-steel plates, and exceptionally good opportunities were afforded to compare the effects on the structure, or the ship's framing, when protected by a plate which like nickel-steel receives nearly all the energy within itself and distributes it over the vessel in shock or racking effect, and the same structure when protected by a much lighter (25 tons nickel to 16 tons Harvey) plate, whose hard surface causes the energy of the blow to be absorbed in the disintegration of the projectile.

The differences were most marked. The heavier nickel untreated plate was set back bodily several inches under impacts of 100 foot-seconds less velocity than the lowest velocity at the Harveyed plate; the latter plate was hardly moved at all until the last round, when the corner struck was set back about the same amount as the ordinary nickel plate mentioned. A full report was made in detail of the test of this plate at the time of the trial.

Many other plates have been tested in the current work of projectile-proof. All have been of mild steel, some from the Bethlehem Iron Company and others from Carnegie, Phipps & Co. All have behaved alike. Long through cracks are formed all over the plate by the passage of a shell. Large fragments are thrown several hundred yards, making the use of such plates very dangerous to persons and dwellings on the station. The early adoption of nickel-steel plates for projectile tests is earnestly recommended. A more uniform test of the shell will thus be insured and a great saving will be effected in the cost of plates for this purpose, as one nickel plate will receive twice as many impacts as a steel plate without going to pieces.

Smokeless powder.—Sample of smokeless powder manufactured at the torpedo station have been fired in the 1, 3, and 6 pounders, 4-inch, 5-inch, 6-inch, and 8-inch guns. Results have been quite satisfactory and corroborative of those obtained last year.

High explosives.—Emmensite and the nitrate high explosive tested last year have been successfully fired from high-power guns up to and including the 6-inch caliber. A detonating fuse has been used with shell charged with emmensite and excellent results obtained. The nitrate high explosive, as before stated, bursts with great violence by the heat and shock of penetration through a 2-inch or a 3-inch steel plate, as well as by fuse ignition alone.

Station machinery, facilities, etc.—The system of traveling crane, railroads, etc., has given thorough satisfaction from its first installation. The crane has proved itself strong and efficient in every particular. The only repairs required have been a new set of traveling trucks, the old ones having been worn down on the treads nearly one-half inch by constant running. The railroad tracks being solidly bedded when first laid have not settled under the weights run over them in the last two years.

A steam capstan on the dock to work the derrick and another near the pump house to pull the cars off the barge are urgently needed. They would pay for themselves in a short time.

The first engine and boiler of the large launch *St. Barbara* (from the Ofeldt Company, of Brooklyn) broke down completely in the fall, and were replaced at the station by a Wells engine of about 80-horse power and a Robert's boiler of 18 feet grate surface.' This combination has worked very well, and with 200 pounds of steam the boat is driven steadily at 11.7 knots' speed. This launch can be run very economically, as one man can attend to both engine and fire, unless on very long trips.

A new boiler has been put in the *Ordnance*, the smaller launch. This boat is generally used to carry the mail to and from Glymont, the nearest post-office.

The whale boat and cutter are in fair condition.

The wharfage front is altogether too narrow. It should be extended upriver to a width of 45 feet, and the upriver side of the wharf be run straight all the way to the shore. This could be done at a cost of about $1,500. In about four years from now the piles supporting the main track for heavy guns will require renewing. These should be sawed off below low water and a regular crib work filled with earth and stone be constructed on them, unless an appropriation can be obtained for an iron pier. The dredged bottom about the dock has held its depth very well.

There is not enough office room. When the last alteration was made to increase the office room the work was done with a view to raising the whole building and putting under it a new story. This would give an instrument room and officers' offices downstairs and clerks' office and a library upstairs. This change is much needed and respectfully recommended.

The station water supply is not sufficient. Wells in this section yield water from surface streams only unless sunk to great depth. An artesian well, with 2-inch pipe, sunk at least 200 feet and provided with a wind engine, is recommended for keeping the tank supplied. Water is particularly needed in greater quantity than at present in case of fire. All buildings on the station are provided with water barrels kept full, grenades, and extinguishers, and the station force has been organized and excercised as a fire brigade, but that no serious loss by fire has occurred is due more to precaution than anything else, for the water supply is utterly inadequate should a large fire get headway.

The erection of cheap dwellings for the leading men and launches' crews is recommended.

Ensigns Tisdale and McCully have been the only assistants since October last, and they have both contributed by their zeal and ability to the dispatch of business at the station.

The accounts of the station have been kept in a very satisfactory manner by the ordnance writer, Mr. J. J. Gering. Owing to the importance of this work it has been necessary to place the ordnance writer in charge of work which properly falls to the department of supplies and accounts, and his services are thus lost to the inspector of ordnance in the department to which he should belong. I wish to express to the Bureau my high appreciation of Mr. Gering's faithfulness and ability and to recommend an increase of his salary to $1,200 per annum.

Very respectfully, your obedient servant,

R. B. DASHIELL,
Ensign, U. S. Navy, Inspector Ordnance, in Charge.

The CHIEF OF THE BUREAU OF ORDNANCE,
Navy Department.

NAVAL PROVING GROUND,
Indian Head, Md., September 13, 1893.

In compliance with the Bureau's letter No. 5412, of August 28, 1893, I have to make the following supplementary report of the work, etc., at this station since I have had charge:

In obedience to orders from the Navy Department, on June 15, 1893, I assumed the duties of inspector of ordnance in charge, relieving Ensign Dashiell, and found everything in good working order and in a high state of efficiency.

Since that time the bank in rear of the velocity battery has been sloped and graded and a brick retaining wall is in process of construction. This was rendered necessary by the sliding of the bank in wet weather. The lower part of the ravine above the new bomb proof has been filled up with the earth removed from this bank and an outlet for the water constructed, so that the bomb proof is no longer flooded during heavy rains.

A roadway has been cut, so that it is now possible to get up on the hill to the office with a conveyance without going up to the head of the valley and around.

Two additional target structures have been constructed on the south side of the valley, near the wharf and railroad track, suitable for mounting heavy plates, and so placed that the 10-inch and 12-inch guns mounted at the range battery can be used in testing plates and projectiles. One of these structures is made with a pit lined with plates, so that anyone of the upright oak supports against which the backing is secured can be removed very easily at any time and replaced when damaged without tearing down the whole structure; and this structure has stood the hammering due to breaking up the *Indiana's* 17-inch plate, in different tests, very well, indeed; was repaired in a couple of days, and is now ready for another 17-inch plate.

A new cast-iron gun circle has been installed on the gun platform at the range battery, and it is now unnecessary to mount and dismount guns there every time the caliber is changed in firing.

The hydraulic accumulator has been installed in place, and only awaits some pipe flanges, now being made at the gun factory, to be tested and used.

Work has been commenced on a light railroad to connect with main track at pump house and to run behind the range battery, so that the ammunition and projectiles for the heavier guns can be conveniently and quickly transported to the gun platform.

The three target structures to the eastward of the range battery, which have been used for nearly all the armor tests of late, are being thoroughly overhauled and repaired. As it was necessary to uncover these structures entirely the earth was removed and used in grading in the valley, and will be replaced by sand from a sand bank near at hand. The sand will reduce the cost of digging in the butts by one-half, and is much more suitable for stopping projectiles.

Firing butts Nos. 1 and 2 have both been completed; have been used repeatedly and answer the purpose very well. One of these (No. 1) has already been dug out once since completion. This was done in a very short time, and the sand was found to have stopped the projectiles in every case.

The steel target structure, reported by my predecessor as having been wrecked, has been removed entirely, as it was no longer of any use and was in the way.

The chronograph and batteries work fairly well; but the rheostats are out of order, and, together with chronograph No. 111, need to be repaired by an instrument maker.

Officers' quarters Nos. 3 and 4, as well as the stables, have been repainted, and such repairs as have been found necessary have been made.

The road running through the Government property has been repaired and put in as good order as possible, and fences have been built where necessary.

Four wells have been dug, increasing the ordinary water supply, but these can not be depended upon during a very dry spell.

A brickyard has been started, and about two or three thousand bricks have already been molded, and it is hoped that the station can soon be supplied with bricks at a much less cost than the ordinary contract price delivered at this station.

The telephone line was put in operation soon after I took charge, and, with the exception of a break of two days after a very severe storm, has worked very well indeed. It is to be regretted that we are not in direct connection with the Bureau, as messages sometimes get mixed up in the transfer, and also that we are shut off from the outside world from 4 o'clock in the afternoon till 9 o'clock in the morning, when the ordnance office at the gun factory closes and opens. The telegraph line has not been put in operation yet and is not necessary at present, but this will serve as an excellent guard wire to the light telephone line and protects it.

The work on the farm has been continued. Enough provender for the stock during the winter has been, or will be, harvested.

Proof of guns.—The following guns have been proved with service rounds: Four-inch R. F. guns, Nos. 40, 41, 42, 43, 44, 45, 46, 47; 5-inch R. F. guns, Nos. 4, 23, 24, 26, 27, 28, 30; 10-inch B. L. R., No. 11. None of these guns failed in proof. Four-inch R. F. G., No. 33, with a liner in the chamber, was tested, but was returned to the gun factory for a reëxamination, as the cases still continued to stick in the chamber.

Proof of powder.—The following samples of Dupont's brown prismatic powder have passed a satisfactory test, and the lots which they represent have been accepted: Twelve-inch powder V. Y-6, and 4-inch powder W. G.-3 and W. G-5.

The following Dupont's powders were rejected, as not coming up to the requirements: Eight-inch powder U. T-24 and U. T-25, 4-inch powder W. G-2 and W. G-4.

Samples of Laflin & Rand's powders, Nos. 1, 2, 3, and 4 were also rejected, as not coming up to the requirements.

Test of projectiles.—The following armor-piercing projectiles have been tested, and the lots which they represent have been accepted: Carpenter A. P. projectiles, 12-inch, lots 1 and 2; 10-inch, lots 16, 17 and 18; 8-inch, lots 1–B (secondary test) lot 2–B. Wheeler-Sterling A. P. shell, 8-inch, lot 1, 6-inch, lot 1.

The following A. P. projectiles were rejected, having failed to come up to the requirements: Carpenter, 8 inch, lot 1-B (primary test); Wheeler-Sterling, 4-inch, lot 1 (secondary test).

On account of not having steel plates of the proper thickness on hand, most of these projectiles were fired against plates of greater thickness of nickel steel, using striking velocities prescribed by the Bureau. In my opinion this is as fair a test for the projectiles as making them go through plate and backing, provided the plate can be struck normally. Lot 1, 4-inch, Wheeler-Sterling, had four different tests, three against thick plates at varying velocities, and one against a 4-inch plate; and the projectiles all broke up in about the same place, at the band score.

Gun mounts.—The only mount tested since I have taken charge is the new 1-pounder top mount, which stood a firing test of about 250 rounds of service ammunition very well indeed. With slight modifications which have been recommended in reports on the subject, this mount will be much more efficient in the service than the old one, as it weighs less, costs less, and is easier handled. The mounts on hand in use at the station have all performed fairly well. A good deal of backlash has been found in the experimental 4-inch mount without directing bar; but I think this a fault of manufacture, as the worms and worm-wheels do not fit perfectly well. The hydraulic mounts work fairly well; but the leaky valves, especially in the 10-inch mount, have given a good deal of trouble. Difficulty has been experienced at times in training and elevating the directing bar central pivot carriages of both the 4-inch and 5-inch type; but this generally disappears when the shafting and gearing are kept perfectly cleaned and oiled. These carriages especially require protection from the weather, which they have so far not received at this station, as the gearing and shafting are very liable to become clogged with slight rust.

Test of cartridge cases.—The following 5-inch cases have been tested and the lots passed: Lot Nos. 42, 43, 44, 45, 46, 47, 48, 49, and 50. There have been no rejections of cases since I have taken charge; but trouble has been experienced with some of the 4-inch cases which have already been accepted: notably, lot No. 4, all cases of that lot giving a great deal of trouble and sticking badly. The 5-inch cases, however, behave very well indeed—some of them have already been fired fourteen and fifteen times without being rendered unserviceable.

Armor tests.—A 9-inch nickel steel plate, representing *Monadnock's* side armor, Group No. 9, Carnegie, Phipps & Co., was tested July 10th, 1893, and passed the acceptance test.

A 17-inch curved nickel steel plate, representing *Indiana's* barbette armor, was tested for premium, and only passed the acceptance test, the 12 inch B. L. R. being used.

A 7-inch nickel steel plate, representing *Terror's* side armor, Group No. 10, Carnegie, Phipps & Co., was tested for premium, which it failed to pass, but did pass the acceptance test.

An 8-inch curved nickel steel plate, representing 8-inch barbette *Oregon*, Group No. 11, Carnegie, Phipps & Co., was tested for premium; failed, and was recommended for acceptance.

Experimental work.—A Taylor cast steel 12-inch shell was exploded in the explosion chamber with very fair results, although it was not considered advisable to use more than 30 pounds shell powder as a bursting charge, on account of the smallness of the chamber.

Experiments with angular fire against curved nickel steel plates, using 6-inch and 8-inch A. P. projectiles, developed the fact that it was impossible to make an A. P. projectile "bite" or penetrate at an angle of 45 degrees with the normal, and that all A. P. projectiles at even small angles of impact broke up and failed to get their maximum penetration; the 8-inch curved nickel steel plate of the *Monterey* especially, having resisted this angular fire at different angles with different calibers and striking velocities very well indeed.

The—Driggs–Schroeder 1-pounder rapid fire gun has been subjected to an experimental test with 200 rounds of service ammunition, fired in about one and one-half hours. The gun stood the test fairly well; several small faults were developed in the breech mechanism which can be easily remedied.

Experiments have been made by firing common shell of the United States and the American Projectile Companies against steel and wrought iron plates of different thickness; and have developed the fact that these projectiles are far superior to the common cast iron shell.

Three Johnson cast steel shot have been fired at a 17-inch steel plate with very fair results, considering the material of the projectiles and the striking velocity, which were those for test of A. P. projectiles, except in one instance, where the striking velocity was 1,890 foot-seconds.

Smokeless powder.—Smokeless powder from the torpedo station has been tested from time to time as received, with varying results.

Station machinery, facilities, etc.—The system of traveling cranes, railroads, etc., is not altogether perfect, the turntable giving a great deal of trouble, as they are not fit for the use for which they are intended and sometimes require thirty men to turn them when loaded. The crane works fairly well; but is very slow, and is incapable of taking a plate the size of the *Indiana's* 17-inch plate. The traveling trucks of the crane which were replaced in June last have already become so much worn that they must soon be replaced. The derrick on the wharf is not safe for more than a 4-inch gun, as the head is cracked, and it should be replaced at once. The wharf should be enlarged and repaired and the piles under the railroad track leading down to the landing stage of the scow should be made into crib work at once before the 13-inch gun is landed.

The launch *St. Barbara* is now being put in good condition at the gun factory. The launch *Ordnance* is in fair condition, and is used to go to Glymont for the mail and for general work of the station, such as carrying out targets, sending officers to range stations, etc. The whaleboat is in fair condition, but the cutter needs extensive repairs. Requisitions have been made and approved for material to enlarge the office, as well as the gunners' quarters, which are both very small and cramped for room.

The station water supply is not sufficient, especially during the dry season, and the only fire apparatus on the station are water barrels, hand grenades, and fire extinguishers at each Government building and house. It is recommended that an appropriation of at least $6,000 be asked for to sink an artesian well, make a supply tank, and run a system of water pipes to all the buildings for fire purposes and water supply, the tank to be supplied by a windmill.

As the steam power is now at hand I think it would be in the interests of economy to light the station by electricity and heat it by steam, and a plant could be installed with the force now at the station without calling in outside labor.

The erection of cheap dwellings for the leading men and boats' crews is urgently recommended, as it is impossible to keep skilled white labor down here unless they have some place to live, and there is no suitable place for such people within 10 or 12 miles. These houses can be built of brick made at the station, and would cost in all about $600 apiece.

Great trouble has been found in keeping good workmen and leading men down here on account of there being no place for them to live, even without their families, and several very desirable men have declined to come down here on that account alone.

A medical officer is absolutely necessary at the station, and there is room for one in the bachelors' quarters. The nearest doctor lives 6 miles away; his professional work takes him all over the county, so that his attendance can not be depended upon within twelve hours after sending for him. Several minor accidents have happened of late, which might have resulted seriously had it not been for the skill of the laboratorian in stopping hemorrhages, dressing wounds, etc. I concur in the recommendation of my predecessor in regard to the work of Mr. J. J. Gering, and also that his salary be raised to $1,200 per annum.

Ensigns R. D. Tisdale and N. A. McCully were on duty at the station when I took charge, and Ensign F. W. Jenkins has since reported for duty. By their zeal and ability they have all contributed to the dispatch of business at the station, and they have been able and willing assistants in everything that has taken place.

The following are the officers employed at this station, with their respective stations and duties:

Name and rank.	Duties.
Lieut. Newton E. Mason	Inspector of ordnance, in charge of station.
Ensign R. D. Tisdale	Assistant inspector of ordnance, in charge of powder, and senior member of board of inspection; observer at chronograph.
Ensign F. W. Jenkins	Assistant inspector of ordnance, in charge of all secondary battery work, ballistic tests of castings; observer at chronograph.
Ensign N. A. McCully	In charge of all projectiles, cases, etc.; also explosion chamber; observer at chronograph.
Gunner P. C. Hanley	In charge of crane, handling guns, and ordnance material; in charge of time book, and general superviser of labor around the batteries.
Pay Clerk James F. Deale	To take charge of stores. At present engaged in changing to the new system of files.

Very respectfully, your obedient servant,

N. E. MASON,
Lieutenant, U. S. Navy, Inspector of Ordnance, in charge.

The CHIEF OF BUREAU OF ORDNANCE,
Navy Department, Washington, D. C.

No. 7.

OFFICE OF INSPECTOR OF ORDNANCE,
Hartford, Conn., June 16, 1893.

SIR: In accordance with the Department's order of June 10, 1893, and the Bureau's direction of the same date, I proceeded to Springfield on the 15th instant to witness the test of a .30 caliber Gatling gun with new feed attachment, and I have the honor to report as follows:

The test took place at the water shops of the National Armory. There were present: Col. Mordecai, U. S. Army, commanding; Capt. Blunt, U. S. Army; Dr. Gatling, the inventor; four representatives and assistants of the Gatling Gun Company, and two assistants from the shops.

The test was an informal one and was, in its nature, a comparison between the army ("Bruce") gravity feed and the new positive Gatling feed.

The gun is the same in design as that at present in use in service, but has been fitted with long barrels chambered to fire the .30 caliber experimental smokeless powder cartridges made at the Frankford Arsenal. Minor changes have been made in the dimensions of locks, etc., to adapt the gun to this ammunition.

The new feed attachment consists of a hopper and cartridge holder or feed strip. The hopper is designed to ship on the gun in a manner similar to that for the gravity feed hopper and is interchangeable with it on the gun.

It is simple in construction and design, being merely a brass gate nearly flush with the gun body, with an orifice through which the feed strip passes. The feed strip is a strip of tin equal in width to the length of a cartridge and of any desired length. The cartridges are held on the strip by two small clips. The clips are part of the strip. and are punched from it. They encircle the cartridge below the head and at the neck, and a small slit in the strip for the cartridge rim permits a cartridge to lie flat.

The action of the feed is that of a rack and pinion, the feed strip and its cartridges forming the rack and teeth and the revolving carrier block the pinion. The strip is fed into the mouth of the hopper from the left, horizontally, cartridge side down. The cartridges then engage in the lock trough of the carrier block, and the strip is thus carried from left to right; its end, which is slightly turned up, enters the exit orifice of the hopper, and the wedge-like edge of this orifice strips the cartridge from the feed strip, the strip emerging from the orifice on the right of the gun.

For convenience in rapid continuous firing a trough is fitted to ship as an extension to the feed mouth of the hopper, in which the strips can be laid, but the trough is not a necessary part of the feed attachment.

The procedure of the test was as follows: The gun was worked first without cartridges to test for smooth working. The gravity feed was then attached and forty dummies run through at moderate speed. Gun worked smoothly, but feed intermittent.

About 300 live cartridges (smokeless experimental U. S. Army) were then fired at slow speed. Feed intermittent, requiring frequent assistance by hand.

About 200 of the same cartridges were then fired, at moderate and variable speed, with the same unsatisfactory working of the feed, which required hand assistance both in the feed down and the oscillating guide.

About 15 per cent of missfires occurred in all. One of the extractors failed to work in two instances, the failure taking place in one of the instances in connection with a missfire, and the cartridge had to be rammed out from the muzzle before the trial could proceed.

The new feed, with trough, was next attached and tried; first, by running through two strips (40) of dummies at moderate speed. Feed worked perfectly.

Ten strips (200) army smokeless cartridges were then fired at the rate of about 1,300 shots per minute. About 15 per cent missfires occurred. Gun and feed worked perfectly.

Six strips (120) Winchester black powder cartridges were then fired at moderate speed. No missfires, and gun and feed worked perfectly.

All the cartridges that missed fire were tried again, about two-thirds requiring two additional blows of the firing pin before firing; and those that were struck three times had the primers pierced.

From the above tests, facts were developed as follows:

The gun worked well in every respect as far as tried, the failure to extract being found due to defective character of the cartridge rim, which was rounded and allowed the extractor no hold. The effort on the crank handles is about the same in both the gravity and new feeds. The missfires are apparently due to defective ammunition and not to any fault of firing machanism.

No attention was paid to the target made by the gun.

The gravity feed is, in my opinion, too unreliable, apart from its inability to feed at higher angles of elevation and depression, and, in view of the existence of an evidently better feed, is inadmissible in the consideration of a machine gun. The defective feed down is due to the want of proper design for the new ammunition. The lighter bullet permits the lower cartridges (nearest the feed mouth) to stand almost horizontal, from the weight of the cartridges above, thus preventing a proper engagement in the wheel of the feed guide. This happens when the feed guides are charged with more than ten cartridges, which thus form the limit of capacity. It is believed this can be remedied by a proper alteration of design, but the oscillating guides for the rims are said never to have worked perfectly automatically, as they were designed to do.

The new positive feed was not exhaustively tested, but worked perfectly. The system admits of making the strips of lengths to contain any number of cartridges, thus permitting an uninterupted stream of fire.

The method of attaching the cartridges to the strips permits compact transportation of ammunition. With a motor attachment or rear crank handle the gun can be served by one man. It is independent of gravity and can be used at all angles of elevation and depression.

It does not require the transfer of cartridges at the gun, as the strips can be made and loaded at any time.

It is inexpensive, and the strips can be recharged by hand. The only objection that I have been able to discover is that the ejection takes places on the same side of the gun as the loading and interferes to a slight extent with this operation.

In my opinion the feed is worthy of an exhaustive trial with a view to its adoption.

The ammunition (.30 caliber smokeless) gave every evidence of imperfect manufacture and design. The missfires may be due to five reasons: Thickness of primer metal; insensitiveness of primer; too great depth of primer in the seat; light mainsprings; short firing pins. From the appearance of the strike on the primer, and the fact that no missfires occurred with the black powder cartridges, the fault is evidently in the new ammunition.

Hangfires, if any, were unnoticed, as the cartridges either exploded in the chamber or not at all.

Very respectfully, your obedient servant,

A. C. DIEFFENBACH,
Ensign, U. S. N., Inspector of Ordnance.

CHIEF OF BUREAU OF ORDNANCE,
Navy Department, Washington, D. C.

No. 8.

NAVAL TORPEDO STATION,
Newport, R. I., August 22, 1893.

SIR: In accordance with the Department's order of the 31st ultimo (copy appended, marked A) and the accompanying instructions of the Chief of the Bureau of Ordnance (copy appended, marked B) I have the honor to inclose herewith the report of the Naval Small-Arm Board, recommending a caliber for adoption preliminary to selecting a system of rifle for the naval service.

The board met as directed at the Torpedo Station at Newport, R. I., on August 15, and during discussion adjourned from day to day until August 20, when a visit was made to the Winchester Repeating Arms Company, at New Haven, and to the Pratt & Whitney Company, at Hartford, Conn., to consult these manufacturers in reference to the feasibility of making ammunition and arms of the caliber the board desired to recommend. The board returned to Newport on the 21st instant.

The report (marked C) was prepared and signed, and the board adjourned on the 22d instant to await further instructions.

Very respectfully, your obedient servant,

G. A. CONVERSE,
Commander, U. S. Navy, Senior Member of Small-Arm Board.

The Hon. SECRETARY OF THE NAVY.
Navy Department, Washington, D. C.

[First indorsement.]

NAVY DEPARTMENT, *August 25, 1893.*

Respectfully referred to Bureau of Ordnance.

By direction of the Secretary:

JNO. W. HOGG,
Chief Clerk.

[Second indorsement.]

BUREAU OF ORDNANCE, *August 30, 1893.*

Respectfully returned to the Department.

It is recommended that the report and recommendations of the board be approved, and that the Bureau be authorized to proceed to carry out these recommendations as laid down on page 8 of the report.

W. T. SAMPSON,
Chief of Bureau of Ordnance.

[Third indorsement.]

NAVY DEPARTMENT, *September 20, 1893.*

Returned to the Bureau of Ordnance.

The recommendation of the Bureau that "the report and recommendations of the board be approved, and that the Bureau be authorized to proceed to carry out these recommendations, as laid down on page 8 of the report," is approved.

H. A. HERBERT,
Secretary of the Navy.

A.

NAVY DEPARTMENT,
Washington, July 31, 1893.

SIR: A board, composed of yourself, as senior member, Prof. Philip R. Alger, Capt. George C. Reid, U. S. M. C., and Ensign Albert C. Dieffenbach, is ordered to convene at the Torpedo Station, Newport, R. I., on August 15, next, for the purpose of considering and deciding upon the caliber of rifle to be used in the naval service, and to test and select the rifle best suited to that service. This duty is in addition to your present duties.

The Bureau of Ordnance, Navy Department, Washington, D. C., will furnish the necessary instructions for guidance of the board.

Very respectfully,

F. M. RAMSAY,
Acting Secretary of the Navy.

Commander G. A. CONVERSE, U. S. N.,
Inspector of Ordnance, Commanding Torpedo Station, Newport, R. I.

B.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,
Washington, August 1, 1893.

SIR: It is the wish of the Bureau that the board should, at its first meeting, consider and decide upon the caliber of rifle to be adopted for the naval service. When this is done, the Department will ask inventors of rifles to present one or more of the caliber decided upon by the board for competition. The board can then assemble a second time, and submit the rifles to such tests as they deem suitable, first submitting their programme to the Bureau for approval.

The Bureau does not consider it necessary that any experiments should be made to enable the board to arrive at a conclusion as to the best caliber to adopt.

The Bureau will furnish the board with reports of trials of rifles of different calibers both at home and abroad, together with all other available information upon the subject.

In arriving at a conclusion as to caliber, the board should give first due weight to the ballistic properties of different calibers; second, it should give due importance to the fact that the Army has adopted a caliber of .30; third, the difficulties of manufacture of rifles and ammunition should have careful consideration; fourth, the advantages in diminished weight in ammunition and rifle for small calibers deserves consideration, though not of great importance in the naval service.

It is understood that the arm adopted is to use smokeless powder. The reports should be submitted to the honorable Secretary of the Navy.

Respectfully,

W. T. SAMPSON,
Chief of Bureau of Odrnance.

Commander G. A. CONVERSE, U. S. N.
Senior Member Small-Arm Board, Newport, R. I.

O.

U. S. NAVAL TORPEDO STATION,
Newport, R. I., August 22, 1893.

The history of the development of small arms shows a constant decrease of caliber accompanied by an increase of ballistic qualities; and the rapid advance of technical science, with resulting improvements in the material and methods of manufacture of modern arms and ammunition, has in recent years given impetus to this movement.

The calibers from .40 inch to .45 inch, generally adopted with breech loading, began to be succeeded by smaller calibers in the years from 1886 onwards, and to-day almost every civilized nation uses a rifle of or below 8 millimeters (0.315 inch) in caliber. With these small caliber rifles the charge is smokeless powder; the muzzle velocity 2,000 foot-seconds or over; the point blank range about 400 meters; the effective range upwards of 2,000 meters; and the number of rounds carried per man, 100 or more.

The arm now in use in the U. S. Navy is of .45-inch caliber; the charge is black powder; the muzzle velocity 1,350 foot-seconds; the sights must be adjusted for ranges above 150 yards; the effective range is 1,200 yards; and only 55 rounds are carried per man.

This progressive reduction of caliber still going on, as evidenced by the recent adoption of the 6.5-millimeter rifle by Italy, Roumania, and Holland, and of the 7-millimeter rifle by Spain and Chili, together with the manifest superiority of the smaller calibers, leads the board to the conclusion that a change of caliber for the Navy small arm is desirable, and that this change should be a reduction.

For the naval service the small arm has two principel uses—in picking off or driving under cover the exposed men of opposing boats or ships, and on landing expeditions.

For the former use great flatness of trajectory and penetrating powers are desirable, distances being usually considerable and uncertain; the weight of the ammunition is unimportant, since the source of supply, the ship's magazine, is close at hand, and the feature of exchangeability with ammunition used by others is valueless.

On landing expeditions, lightness of ammunition, allowing a large number of rounds to be carried, is of great importance, especially in the probable case of the landing being in a savage country where transportation, excepting on the person, is difficult or impossible. But here, also, the use of the same ammunition as others can only be desirable where a combined expedition of naval and other forces is undertaken, and such cases will rarely occur, since the weight of authority is against the use of naval forces in prolonged or distant land service, and since in any case where it became necessary to land a military force the naval force could probably be best employed in keeping open communications and as a base of supplies, ammunition being furnished from transports and storeships specially fitted out for the expedition. The usual duties of naval landing parties are likely to be only such as protecting property and putting down mobs in seacoast cities, and in necessary attacks upon savage or semicivilized people in their own countries; in either case, the expedition being purely naval and of limited extent and duration, and for such duties interchangeability of ammunition would be of no importance.

Considering then that on the actual field of war the ballistic and tactical qualities of the Navy small arm are far more important than that its ammunition should be the same as used by the Army, it remains to determine the advantages of the latter feature in manufacture and supply at home. Small-arm ammunition for the Army is now made at the Frankford Arsenal, while that for the Navy is made in private factories. In time of war it would be necessary to employ all the resources of the Government and private factories in the manufacture of ammunition, and it does not appear either that the expense would be greater or that any complications could arise from the use of different ammunition used by the two services.

Consequently the board concludes that the advantages which would result from the use of a common ammunition by the U. S. Army and Navy are not sufficient to warrant any considerable sacrifice of ballistic or tactical qualities.

It becomes then a question whether there is any small arm of different caliber from that adopted by the U. S. Army which possesses materially superior ballistic or tactical qualities, and an examination of the records of tests of arms recently adopted or experimented with abroad shows that there are such arms, and the board concludes that their superiority results from the smaller calibers.

The following table gives the data of the U. S. Army 0.30-inch caliber and the Mannlicher 6.5-millimeter (0.256-inch) rifles:

	U. S. Army.	Mannlicher.
Caliber .... inches..	0.300	0.256
Weight of gun without bayonet .... pounds..	8.75	8.46
Length of barrel .... inches..	30.00	28.75
Weight of bullet .... grains..	220	162
Weight of round complete .... do....	410	338
Muzzle velocity .... foot-seconds..	2,000	2,390

The sectional density of the 6.5-millimeter bullet being the same as that of the 0.30-inch caliber, its carrying power is the same, and, having a vastly greater initial velocity, its trajectory is flatter and its terminal velocity is greater at all ranges. The penetration of the smaller bullet is also the greater, at least at effective ranges. Moreover, the 6.5-millimeter ammunition being the lighter, one-fourth more rounds of it can be carried with equal total weights. Finally the shock of recoil is less with the smaller caliber, notwithstanding its greater muzzle velocity.

The following are some of the results obtained with the 6.5-millimeter Mannlicher rifle in actual use:

Round.	Range.	Penetration.
	Yards.	
1	15	27.2 inches in beech blocks.
2	50	49 inches in pine wood.
3	330	32.6 inches in packed earth.
4	2,730	4.4 inches in pine wood.

Angle of elevation.	Range.	Angle of fall.	Remaining velocity.
° ′ ″	*Yards.*	° ′ ″	*f. s.*
0 04 00	109	0 04 50	2,132
0 25 10	545	0 34 40	1,460
1 11 30	1,093	1 51 20	1,082
5 23 20	2,186	9 39 20	663
9 16 00	2,731	16 50 30	571

Trajectory for 491 yards range—Distance, 83 yards, 165 yards, 247 yards, 288 yards, 328 yards, 409 yards, and 491 yards; height, 17 inches, 28 inches, 32 inches, 33 inches, 31 inches, 20 inches, and 0 inches.

Height of rifle.	Height of target.	Danger space.
Feet.	*Feet.*	*Yards.*
*4.9	†4.9	550
*4.9	‡8.9	710
§1.9	†5.9	600
§1.3	‡8.9	790

* Standing. † Infantry. ‡ Cavalry. § Reclining.

For comparison with the above, the following are some results obtained with the 8-millimeter rifle, having an initial velocity of 2,034 foot-seconds. Penetration in beech blocks at 15 yards from muzzle, 20.8 inches, against 27.2 inches for the 6.5-millimeter; danger space, fired standing against infantry, 450 yards, or 100 yards less than for the 6.5-millimeter; greatest height of 660 yards trajectory, 9.4 feet, against 5.4 feet for the 6.5-millimeter.

The great superiority of the 6.5-millimeter rifle over the larger calibers from a ballistic and tactical point of view is apparent and explains the fact that this caliber, or the 7-millimeter, has been the choice of every nation which has recently adopted a new arm. Moreover, even those countries which have rearmed with the 7.5 to 8 millimeter calibers, have carried on, or are now engaged in extensive tests with the smaller calibers and appear to be only deterred from adopting them by the enormous expense of a second rearming.

As an example of the trend of opinion abroad, it may be stated that only one gun of a caliber about 7-millimeters was brought before the commission which, in November and December, 1892, tested arms for adoption by Chile, and all except this gun gave initial velocities of 2,400 foot-seconds or over.

Furthermore, while as yet no nation has adopted a less caliber than 6.5-millimeters, extensive tests with 6, 5.5, and 5-millimeter rifles have been carried on and several high authorities advocate the immediate adoption of the smallest of these.

The superior qualities, both ballistic and tactical, which theory indicates as the result of a decrease of caliber, having now been confirmed by practical tests and demonstrated beyond doubt for calibers as low as 6.5 millimeters, it is necessary to examine the reasons for fixing a limit to this reduction of caliber and to determine this limit.

First, there are difficulties of manufacture which have constantly retarded the movement of reduction of caliber, but which have gradually been overcome until with modern processes 5-millimeter guns can be, and have been, constructed. Increased cost of arms and ammunition accompanies any reduction of caliber, but it becomes considerable only when the minimum caliber is approached.

Next is the difficulty that with the increased velocities and twist of rifling accompanying the smaller calibers the strains are also greatly increased; but improvements in the quality of steel used for barrels, and the greater strength and security of modern breech mechanisms enable these strains to be safely withstood, and prevent the rapid wear of the barrel which results from the use of inferior material. The use of jacketed bullets without lubricant and of powder with little or no residue, together with the ease with which modern breech bolts can be removed, tend to prolong the life of small-caliber arms and to render their care and preservation in service entirely practicable.

Last is the objection to the small calibers that the wounds produced by them will frequently not be sufficient to immediately put the wounded out of action and that their shock will not stop the onset of excited men at short range. In reply to this it may be said that reports of the effect of modern arms of about 8 millimeters caliber in actual warfare all point to the efficiency of these arms; that experience with the smaller calibers has been limited to experiments whose results are contradictory; and that this objection holds nearly equally for all modern rifles. Therefore the Board concludes that this doubtful and unproven disadvantage should not be allowed to outweigh the many certain and proven advantages of the very small calibers.

The two great arguments in favor of the smaller calibers are their higher ballistic qualities and the decreased weight of their ammunition, but neither of these advantages is proportional to the decrease of caliber, since the weight of charge and cartridge case must be kept up in order to increase the velocity as the caliber decreases. Consequently the reduction in the weight of ammunition as the caliber is reduced from 6 to 5-millimeters will be extremely small, if the velocity is maintained or increased, and since the 5-millimeter is the smallest caliber that has yet been manufactured and since its efficiency depends upon a choice of the finest material and the most accurate workmanship, involving a very considerable increase of expense, it would appear that in the present state of the art a reduction of caliber below 6 millimeters is not advisable. As a means of reducing cost the board recommends the adoption of the millimeter as the unit, since the possibility of manufacturing arms for foreign nations or disposition of the machinery after completion of the necessarily small order for the Navy, would tend to promote competition.

Therefore, after a careful consideration of the foregoing facts and arguments, and after having satisfied itself by personal interviews with manufacturers that arms and ammunition of 6-millimeters caliber can be made without special difficulty, the board concludes that a small arm of 6-millimeters caliber should be adopted for the United States Naval service, and an arm with the following principal characteristics is recommended:

Caliber	6 mm. (0.236 inch.)
Weight of bullet	About 135 grains.
Weight of charge	About 33 grains.
Capacity of case	35 grains.
Pitch of rifling	1 turn in 6.5 inches.
Number of grooves	6.
Depth of grooves	About 0.003 inch.

From computation based upon results obtained with the Troisdorf powder in the 0.30-inch caliber rifles, the board believes that with the proposed arm a muzzle velocity of 2,400 foot-seconds can be attained with a maximum pressure less than 50,000 pounds per square inch.

In this recommendation due consideration has been given to the desirability of using the same ammunition for machine guns as for the small arm, and the board deems that no difficulty in the manufacture or manipulation of machine guns will be caused by their use of 6-millimeter ammunition.

The following tables give the comparative data of the proposed 6-millimeter and the U. S. Army .30-caliber rifles, both being computed, from which it will be seen that with the 6-millimeter rifle the trajectory is flatter, the remaining velocity greater, and the shock of recoil less than with the .30″ rifle, while one-third more rounds of ammunition can be carried with an equal weight.

Trajectories.

[500 yards.]

	Caliber.	
	.30 inch.	6^{mm} (.236″).
Muzzle velocity .... foot seconds..	2,000	2,400
Terminal velocity .... do....	1,134	1,331
Angle of elevation	32′ 00″	22′ 15″
Angle of fall	46′ 54″	32′ 48″
Height of vertex .... feet..	4.23	2.95
Distance of vertex .... yards..	274	275
Time of flight .... seconds..	.97	.85
Danger space of 6 feet .... yards..	500	500
Proportional deviations due to side wind	1.02	1.00
Energy of recoil .... foot pounds..	10.9	7.2

[1,000 yards.]

Muzzle velocity .... foot seconds..	2,000	2,400
Terminal velocity .... do....	853	923
Angle of elevation	1° 36′ 25″	1° 10′ 50″
Angle of fall	2° 41′ 42″	2° 10′ 08″
Height of Vertex .... feet..	28.57	21.70
Distance of vertex .... yards..	564	564
Time of flight .... seconds..	2.39	2.25
Danger space for 6 feet .... feet..	132	106
Proportional deviations due to side wind	0.89	1.00

GEORGE A. CONVERSE,
Commander, U. S. Navy, and Senior Member.
GEORGE C. REID,
Captain, U. S. Marine Corps, Member.
PHILIP R. ALGER,
Professor, U. S. Navy, Member.
A. C. DIEFFENBACH,
Ensign, U. S. Navy, Member.

No. 9.

BOARD FOR TESTING "VESUVIUS" GUNS,
U. S. S. PHILADELPHIA,
Port Royal, S. C., February 24, 1893.

SIR: We beg to inform you that in accordance with your order of the 18th ultimo (the copy appended, marked A), the board therein named assembled at Port Royal, S. C., and going on board the U. S. S. *Vesuvius*, on the 30th ultimo., proceeded to test her pneumatic guns in accordance with the programme in your said order. A copy of this programme is appended, marked B.

Lieut. S. Schroeder, U. S. Navy, the commanding officer of the *Vesuvius*, informed the board that he had completed the practice for ranging the guns, required by paragraph 1 of the programme, and presented to the board for use in the trials three curves, diagrams drawn in pencil on squared paper, which curves, he stated, were the result of his work. He was directed to submit a written report on his work of ranging the guns (order marked C, report appended marked C′), and some time afterwards, at the desire of the board, he traced his range curves in black ink, and placed also on the same sheets the "points of fall" that he obtained in ranging, together with the range curves and points of fall obtained by the board in all its practice that took place near the naval station for ranging. These sheets are appended, marked D, E, F, and show the settings of auxiliary valve of each gun called for by paragraph 2 of the programme for each range from about 500 yards up to 2,000 yards.

On the morning of the 31st ultimo the board began its practice for accuracy, as laid down in the second paragraph above mentioned, and the first shot was fired with a setting of the auxiliary valve taken from Lieut. Schroeder's pencil range curve, before mentioned, for that gun; but, as this resulted in a range 110 yards shorter than that expected, Lieut. Schroeder produced before the board range curves, drawn in pencil, on a much larger scale than those that he had presented before. These large-scale curves, he stated, were those from which the approximated smaller scale pencil curves were obtained, and the larger curves were used by the board for obtaining valve settings during the rest of the practice. Under paragraph 2 of the programme, 19 shots were fired in all. On the 31st, 12 shots were fired. Of these, two from each gun, or six in all, were fired with settings taken from Lieut. Schroeder's curves, for a distance of 2,000 yards, and six were fired in like manner with valve settings obtained from the same curves for a distance of 1,500 yards.

On the 1st instant, six shots were fired, in the same manner as on the previous day, for a range of 1,000 yards, and on the same day it was intended to fire six shots, in the same manner, for a range of 500 yards, but, owing to the apparent imperfection of Lieut. Schroeder's curves for that distance, it was thought advisable to fire but three shots, only one of which, that from the middle gun, fell in the neighborhood of the 500-yard point. Of the remaining two, one, that from the starboard gun, fell at 131 yards, and the other, from the port gun, did not leave the bore. Another attempt was made to fire this gun with the same setting, the result being the same as before. The gun was then fired a third time, with a setting taken from a special range curve, swept through two points, one being deduced from the board's practice with the gun when using Lieut. Schroeder's range curve, when it was expected that a range of 1,000 yards would be obtained; the other being a zero point suggested by Lieut. Schroeder. The valve setting taken from this curve proved to be erroneous, and the shot ranged only about 60 yards.

The starboard gun—the projectile from which, at its last round, had ranged 131 yards—was then fired, with a valve setting for 500 yards, obtained from a special range curve, one point of which was deduced from the board's practice with the gun, when by the use of Lieut. Schroeder's curve it was expected that a range of 1,000 yards would be obtained, and the other from the preceding shot made from this gun at a range of 131 yards. The curve appeared to be fairly correct, the shot falling at 514 yards.

There now remained two projectiles of the twenty-four allowed by the programme for the accuracy practice, and the board considered that it would be best to fire one of these for a range of 2,000 yards from the starboard gun, and the other for 1,500 yards from the port gun, some of the shots from these guns having apparently indicated that their respective range curves to be determined under paragraph 1 of the programme would require more data at these points. These shots were fired with a setting of the valve in each case obtained from a special range curve, deduced from the practice of the board under paragraph 2 of the programme. The result seemed to show that the new range curve was defective, giving valve settings that allowed a "loss of pressure" too great in the case of the starboard gun, which sent its projectile 2,076 yards, and too small in the case of the port gun, the projectile of which fell at 1,441 yards.

As before remarked, during the board's practice just described, the setting of the valve of each gun was taken from its range curve obtained by Lieut. Schroeder in his ranging practice with that gun, held a few days previously under paragraph 1 of the programme, and the board soon observed that these valve settings did not give the ranges called for by Lieut. Schroeder's curve diagrams; thus far in the practice the difference between the ranges above 500 yards taken from these diagrams and the ranges actually obtained by the board's practice varied between −149 yards and +56 yards. At a valve setting for 500 yards, only one shot out of three had any effective range.

When the points of fall of the shots fired by the board were plotted, and the resulting range curves were compared with those obtained by Lieut. Schroeder in his practice, the differences above mentioned were clearly exhibited, and the board was inclined to think that the same valve setting for any particular gun might not give the same range on different occasions, within the limits demanded by service conditions.

If such a change in the functioning of the guns were liable to occur, that fact would have a most important bearing upon the value of the pneumatic system, as exemplified in the *Vesuvius*, and therefore it became necessary to determine without doubt, as far as the means at hand permitted, whether, and to what extent, such liability existed. These considerations caused the board to decide that instead of using the twelve remaining blank projectiles in the moving trials laid down in paragraphs 3, 4, and 8 of the programme, it ought to use them as far as might be possible, or necessary, in investigating the tendency of the guns to change their performance, as before mentioned.

The decision was made to continue firing over the range, still using the same valve settings for each gun that were taken from Lieut. Schroeder's range curves and that were used during the 19 rounds of the board's accuracy practice under paragraph 1 of the programme, in order to discover with what degree of closeness its own ranging results would be duplicated.

During the 2d instant the board was engaged in discussions concerning the proposed change in the program above mentioned, and in getting the views of Lieut. Schroeder on the cause of the difference between the results of his range practice and of that of the board. He appeared to be inclined to the opinion that a change had taken place in the functioning of the guns since his practice had taken place. He could not assign any definite cause for such change, but considered that one of the chief causes was probably the imperfection of the vulcanized fiber buffers used in the auxiliary valves, and was inclined to the opinion that if the guns were fired with the same "losses of pressure" that had been shown in the board's practice of the preceding days, practically the same ranges that were obtained on those days would again be obtained; previously to this formal discussion the same matter had been informally talked over. The board then directed Lieut. Schroeder to prepare for each gun curves showing the ranges for the "losses of pressure" obtained both in the board's previous practice and in his own. These curves are appended marked, D, E, F.

On going aboard the *Vesuvius* on the 3d instant, in order to carry its decision mentioned in the second paragraph preceding, the board was informed by Lieut. Schroeder that there was a leak past the main valve of the starboard gun, and that consequently that gun could not be used in the day's practice.

Therefore the board fired three shots from the middle gun and four from the port gun, the observers being out upon the stations. Of these shots, one from each gun was fired with the valve setting that the board had used during the previous practice, when it had been expected that a range of 2,000 yards would be obtained; one from the middle gun and two from the port gun were fired, with valve settings in each case that had been previously used by the board when a range of 1,500 yards had been expected, and one was fired from the middle gun and one from the port gun with settings that had been borrowed by the board in its previous practice when a range of 1,000 yards had been expected, the expectation as to range in each case having been formed from the use of Lieut. Schroeder's range curves. The ranges thus found were to be compared with those obtained by the board in its previous practice when the same valve setting had been used. The result of this practice will be seen in the following tabular abstract from the record:

Gun.	Valve setting.	Ranges.							
		A. As shown by Lieut. Schroeder's range curves.	B. Mean obtained by board, Jan. 31, Feb. 1.	Difference between A and B.	C. Mean obtained by board Feb. 3.	Difference between A and C.	D. Mean obtained by board Feb. 6.	Difference between A and D.	Difference between the board's ranges.
		Yards.	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*
Port	367	2,000	2,036	36 *o*	2,070	70 *o*			34 o
	439	1,500	1,471	29 *s*	1,233	167 *s*			238 *s*
	486	1,000	872	128 *s*	675	325 *s*			197 *s*
Middle	355	2,000	1,921	79 *s*	2,052	52 *o*			131 o
	470	1,500	1,378	122 *s*	1,402	98 *s*			24 o
	514	1,000	1,047	47 *o*	990	10 *s*			57 *s*
Starboard	499	1,000	875	125 *s*			996	4 *s*	121 o
	415	1,500	1,457	43 *s*			1,514	14 *o*	57 o
	381	2,000	1,858	142 *s*			2,015	15 *o*	157 o

The board then concluded to proceed to the determination, as far as the data would allow, of the probable rectangles and other matters relating to the accuracy of the port and middle guns, and for this purpose, and also in order to allow time for repacking the main valve of the starboard gun, and for the preparation by the officers of the *Vesuvius* of matters for use with the board's report, no practice was had on Saturday, February 4.

On Monday, February 6, the starboard gun, having in the meanwhile been put in order, the following rounds were fired from it: One at a valve setting which, by Lieut. Schroeder's range curve, should give a range of 1,000 yards; one which, by the same curve, should give a range of 1,500 yards, and two which by the same curve should give a range of 2,000 yards. The shooting for all these ranges gave points of fall very much nearer to those taken from Lieut. Schroeder's range curves than were obtained in the board's previous practice with this gun (for convenience this practice has been added to the table on the preceding page, where it is compared with the board's previous practice from the same gun). The board, having now secured a sufficient number of points of fall of shot fired under similar circumstances for computing probable rectangles for the starboard gun at about 1,000, 1,500, and 2,000 yards, fired one more shot with the middle gun with a valve setting which, by Lieut. Schroeder's curve, should give a range of 2,000 yards. This shot fell 38 yards short of that range, and completed the number of shots necessary for obtaining probable rectangles with the middle gun at about 1,000, 1,500, and 2,000 yards. Data for rectangles at about the same ranges had been previously obtained with the port gun. The blind projectiles were now exhausted, and it will be perceived that the board had not obtained points of fall sufficient for calculating the probable rectangles for a range of about 500 yards. The reason for this was that there not having been enough blind projectiles at the board's disposal to secure the necessary data for computing probable rectangles for all the ranges mentioned in paragraph 2 of the programme, it was judged to be best to develop the accuracy of the guns at the more distant ranges, rather than at 500 yards, it being considered that the greatest usefulness in warfare of the pneumatic system, as installed on the *Vesuvius*, would probably be beyond the range of 500 yards.

February 8 Mr. John Rapieff reported for duty and submitted to the president of the board his orders from the Bureau of Ordnance (a copy appended, marked G). He produced a drawing of his fuse (copy and explanation appended, marked H) and explained its action, after which he requested permission to determine the proper size of the two safety pins, *f f*, that are used for holding in place the two sleeves that constitute the safety device for holding the direct-action percussion plungers disposed around the head of the ogival of the shell. In making this request Mr. Rapieff said that he would wish to fire from the *Vesuvius* guns one or more rounds, using a temporary wooden projectile weighing about 150 pounds, with the fuse fixed in its head. At the same time he stated in effect that he had had no opportunity of trying or testing the fuses of the design he had presented. He was granted permission to make the desired experiment.

Five projectile torpedoes, each containing in its head a "blowing charge" of ten pounds of gunpowder, the rest of the cavity being filled with wood, had been furnished to the vessel from the torpedo station for use in the preliminary trial of the fuses; but after an extended discussion the board decided that it was not advisable to proceed to fire from the *Vesuvius* during the rest of the trials projectiles loaded with 200 pounds of gun cotton, intended to be detonated by means of these fuses, having fulminate of mercury for their actuating material, without first ascertaining their safety of action within sufficiently assured limits by the use of a greater number of "blowing rounds" than five. It was therefore decided to unload seven of the loaded projectiles and to substitute a suitable mixture of wood and cement for the gun cotton that they contained, leaving in the head of each sufficient space for the insertion of the "blowing charge" of fifteen pounds of gunpowder. This would afford twelve rounds in all for the test of the fuses, which is the least number that, in the opinion of the board, ought to be used in ascertaining the certainty and safety of action of the fuse, the premature explosion of one of which in a loaded projectile would involve the destruction of the vessel.

During the day the observation party from the *Philadelphia*, aided by the *Wahneta*, was engaged in placing the buoys and establishing the ranges to be used in the coming trials of the fused projectiles containing the "blowing charge" of gunpowder, and also with the trials under paragraph 6 of the programme.

Mr. Rapieff was engaged on board of the *Vesuvius* making experiments on the proper size of the pins *f f* (see drawing of fuse appended, marked II). For this purpose the *Vesuvius* fired her guns several times, the temporary projectile before mentioned being used.

Thursday, the 9th, work connected with the sleeve-shearing pins *f f* of the fuse was continued by Mr. John Rapieff aboard the *Vesuvius*, several more rounds being fired with the temporary projectile above mentioned.

Friday, the 10th, Mr. Rapieff having stated that he was ready with the fuse and the observers being at their stations on Hilton Head, at about 10 a.m. the *Vesuvius* steamed to the range and proceeded to fire five projectiles for the purpose of testing the fuses. These projectiles were loaded with wooden disks and a small quantity of hydraulic cement, all so disposed as to retain the same weights and to bring the center of gravity, as nearly as possible, to the same position as in the projectiles loaded with gun cotton. In the front end of the cavity of each projectile and close to the primer of the fuse a bursting charge of 10 pounds of gunpowder was placed close around the copper case or sleeve which is intended to receive the brass case of the gun-cotton primer. The gun-cotton primer and the fuse proper were then screwed into place, the former containing 8½ ounces of dry gun cotton. It was hoped that if the fuse worked successfully the 10 pounds contained in the head of the projectile would be ignited by the primer G shortly after contact with the water, and that an explosion would take place that would be visible to the surrounding observers, affording thus proof that the fuse could effect ignition of the torpedo charge. All five of these projectiles were fired from a position quite near to and abreast of the 2,000-yard buoy, the valve settings in each case being those given by Lieut. Schroeder's range diagrams for a range of 2,000 yards, the vessel being so handled as to cause the plane of sight to pass through the target, which consisted of a small platform with a pole in the center about ten feet high, around which several barrels were stacked. The ranges obtained were as follows, the points of fall in each case being observed with theodolites from each end of the base line on Hilton Head:

Gun.	Valve set	Ranges.		
		As shown Lieut. Schroeder	Obtained by board.	Difference.
		Yards.	Yards.	
Starboard	[illegible]	2,000	1,982	18 short.
Middle	[illegible]	2,000	2,015	15 over.
Port	[illegible]	2,000	1,975	25 short.
Starboard	[illegible]	2,000	1,975	25 short.
Middle	[illegible]	2,000	2,015	15 over.

It will be perceived that the ranges given by the guns this day are much more in accordance with Lieut. Schroeder's range curves than was the previous practice, except February 6, when the starboard gun, after being overhauled, performed quite as well.

Only one of these shot ricochetted, and that, after plunging entirely under water, as usual, for a space of about 20 feet, rose and made a long and rather low leap in the general direction of the line of fire. The others did not rise, nor did there appear any disturbance of the water except the usual splash caused at the point of fall. The character of the flight was about the same as generally obtained over the 2,000-yard range. This was the first practice during which the wind was blowing across the line of fire. Its force was about 15 miles per hour, and its direction from the southeast and nearly perpendicular to the direction of flight. It cannot be asserted that this wind exercised any appreciable influence upon the flight of the projectiles. The observers on the *Vesuvius* thought that they struck some two or three yards to leeward of the target. They plotted within a breadth of about 50 yards perpendicular to the line of fire, two being to windward of the target and three just to leeward.

Of course the chief object of this practice was to find whether the fuses functioned properly, and if as a consequence explosion of the projectile was obtained at the time or shortly after it struck the water. The action of the projectile as to the occurrence of the explosion was observed by three officers with glasses aboard the *Vesuvius* and by one without glasses in a steam launch stationed about a quarter of a mile from and abreast of the target. The tug *Wahneta*, with an officer on board, was also placed abreast of the target and about three-fourths of a mile distant from it. The officer at the nearest end of the base line on Hilton Head and abreast of and distant from the target about 2,000 yards, also observed incidentally the action of the projectile at the point of fall. Opinions differed somewhat as to whether any explosion had taken place during the practice. The two officers with glasses aboard the *Vesuvius* thought that they detected faint smoke near the points of fall; but another officer aboard the *Vesuvius* and those in the boats and at the range station on shore did not see any explosion. All but the observer on Hilton Head heard a report somewhat like that produced by firing a musket, which occurred at the moment of contact with the water; but it was considered by most of these observers that the report was only what had generally occurred during the previous practice with blind shell. A few thought they detected a faint smoke at the point of fall; but it is certain that no smoke due to the explosion of 10 pounds of cannon powder was observed.

On completion of this practice the *Vesuvius* and *Wahneta* returned to the naval station at Port Royal to take in coal, and the former to receive and fit seven projectiles, each to be fused and to contain 15 pounds of gunpowder in the forward part, for use in continuation of the test of the fuses.

On the morning of the 11th, seven loaded projectiles having been emptied of gun cotton, as above mentioned, were filled with wood and cement in accordance with the direction of the board given on the previous afternoon, the aim being to preserve the weight and proper position of the center of gravity. Three of these projectiles were fitted with brass primer cases G (see appended drawing of fuse), each pierced with sixteen five-eighth-inch holes. These were covered with strips of thin paper on the inside, and the cases were filled with coarse-grained black powder taken from three powder cartridge cases. The other four projectiles had their brass primer cases removed, and the copper cases in which the brass primer case had formerly been inserted (see appended drawing marked H) were filled with the same kind of powder as above described, placed in serge bags. These cartridges filled the copper cases completely. The object of this arrangement was to show whether the piercing of the brass primer case or its entire removal would facilitate the ignition of the blowing charge of 15 pounds of black powder which had been placed in each shell, around the outside of the copper case; the idea having been advanced that the brass primer cases used the previous day had resisted the rupturing force of their inclosed powder charges, and had thus prevented the ignition of the blowing charge in the head of the torpedo. In order to get more conclusive evidence of the explosion of the torpedo, the blowing charge was increased to 15 pounds.

At the suggestion of the board "the delayed action composition" was removed from one of the fuses, and the channels that it had occupied in the fuse were filled with ordinary sporting powder. The upper ends of the channels were stopped with small plugs of photographic cotton. It had been thought that perhaps the cause of the failure of the shells to explode on the previous day had been a failure of the time composition to burn, and therefore, in case the fuses fitted with the time composition should fail to cause an explosion of the projectile in the first two rounds of the practice, it was intended to try this fuse with the time train removed and powder substituted, in hopes that an explosion might be obtained. Mr. Rapieff approved this plan.

The *Vesuvius* got on the range, with these preparations made, about 3 p. m.; the observers with their theodolites being at their stations as usual, and while firing the vessel was held at her station near and abreast the 2,000-yard buoy by means of her engines, the line of sight being brought through the target as nearly as practicable before firing, in each case there being probably but very slight variation. As it was very much desired to ascertain with certainty whether any explosions of the projectiles were obtained at or soon after contact with the water at the point of fall, two of the members of the board proceeded in the *Wahneta* to the other end of the range and occupied a point abreast of and within about 500 yards of the target, and from whence it could be seen with perfect distinctness. An officer with a camera for photographing point of fall was also placed abreast of the target and about as near to it as the *Wahneta*.

Four rounds were fired with a valve setting for each gun that, by Lieut. Schroeder's curves, would give a range of 2,000 yards. The following ranges were obtained:

Gun.	Valve setting.	Range taken from Lieut. Schroeder's curves.	Range obtained.	Difference.
		Yards.	*Yards.*	
Port	367	2,000	2,005	5 over.
Starboard	384	2,000	1,950	50 short.
Middle	355	2,000	1,977	23 short.
Starboard	384	2,000	1,900	100 short.

The first projectile fired was fitted with one of the primer cases pierced with holes; the second had no primer case; the bag of powder being fitted as before described was used instead; the third and fourth were also fitted with the bag of powder.

A small quantity of photographer's cotton was placed by Mr. Rapieff in the lower flash chamber of each fuse. The fuses in all their details were prepared by Mr. Rapieff. The fitting and the charging of the primer cases and of the bags of powder which in the last two rounds replaced them was done with the entire approval of Mr. Rapieff.

In the opinion of the two members of the board embarked on the *Wahneta*, no explosion was obtained from the first round, the second being very doubtful: whereupon the board directed that the fuses with the time composition removed and the latter's place filled with sporting gunpowder, and that they be used in the next two rounds; and as, in the opinion of the two members above mentioned, no explosion was obtained, it was decided to stop the practice for the day.

There was no positive indication of an explosion from any of the projectiles. They were within plain view of the members of the board who were on the *Wahneta* near the target, and the behavior of the projectiles at their entrance into the water appeared entirely as usual. The opinion that no explosion had probably taken place was concurred in by the officer in the steam launch and by the observer at the nearest end of the base line on Hilton Head. The observers on board the *Vesuvius* were divided in opinion. It was decided by the board to make an experiment on the following Monday morning, for the purpose of exhibiting the conditions produced by the explosion of 15 pounds of gunpowder when submerged at depths of about 2 fathoms, 4 fathoms, and 7 fathoms, the object being to determine whether explosion of the projectiles could have taken place in the practice of the 10th and 11th instants without the board having observed it. For this purpose three gun-cotton torpedo cases, each containing 15 pounds gun powder, which about half filled the case, and a service detonator, were prepared with buoys, depth line, etc.

About 9 a. m., February 13, the torpedoes above referred to, being taken a short distance from the *Philadelphia*, were successively exploded in the presence of the board. The one exploded at a depth of 7 fathoms was at a distance of about 100 yards from the ship. Its discharge produced a moderate shock upon her bottom, but no report was heard, and the surface of the water above was entirely undisturbed, and no smoke was observed. Shortly afterwards a moderate whirlpool appeared near where the explosion had occurred, but opinions differed as to whether any relation existed between the two, as there were tide rips and whirls in the immediate vicinity. The torpedo submerged to a depth of 4 fathoms, when exploded threw up a jet of water and foam to a height of about 30 feet, with a diameter of about 20 feet. There was a muffled report, but no smoke was visible. The one submerged to a depth of 2 fathoms threw up a jet of about 15 feet in height and about the same in diameter. No smoke was observed; the water in the lower part of the jet was discolored, and presented a greenish-black appearance, which discoloration remained upon the surface in the form of a large blackish spot after the subsidence of the jet. The report in this case was somewhat less than in the preceding. As there was about 5 fathoms of water under this torpedo, and as, notwithstanding its comparatively small submergence, the jet was much less in height and volume than that produced by the preceding explosion at 4 fathoms, it seems probable that only part of the charge was utilized, possibly from leakage.

In the practice that had thus far occurred with the projectile torpedoes loaded with 10 and 15 pounds of gunpowder the board had been confirmed in its opinions that no complete explosions had taken place at depths over 2 or 3 fathoms by the fact that no smoke had appeared; but the results of the experiments above referred to show that the absence of smoke is not necessarily an indication that explosion has not taken place at or near the depths named; still, as there was no jet that could be distinguished from the usual splash due to the projectile's contact with the water, the board was still of the opinion that no complete explosion of the charge, and indeed probably that no explosion of any kind, had taken place at a less depth than 4 fathoms. As to any chance of the projectiles having exploded at greater depths or after arriving at the bottom in a depth of 7 fathoms; though it is admitted that the experiment first above mentioned would seem to indicate that the explosion of 15 pounds of gunpowder at that depth might take place without a disturbance at the surface of the water, still it is thought by the board to be about certain that if the percussion ball of the torpedo fuse had not worked in time to explode the charge before the torpedo had reached a depth of 4 fathoms, it is extremely improbable that action would have taken place below that depth, when the remaining velocity of the projectile must have become very trifling.

The board then went up to the naval station and held a meeting on board the *Vesuvius* while that vessel was taking in coal. Views were exchanged with Lieut. Schroeder and Mr. John Rapieff, and as a result, it was decided to unload the three remaining projectiles that had been loaded with 15 pounds of gunpowder, and to load them with as much wet compressed gun cotton as the powder cavity would contain; also fitting to them the primer-case G and its protecting sleeve in the usual manner, the primer-cases to be loaded with compressed dry gun cotton, and the fuses to be fitted in accordance with the regular drawing appended, marked H, excepting that in one case the time trains were to be removed and sporting powder was to be substituted for them. It was thought that if no explosions were obtained from the projectiles thus arranged the fuse must be considered as to have thus far failed, as far as the percussion ball and delay-action train are concerned.

On the morning of the 14th the *Vesuvius* came down to the Sound, having on board the three projectiles prepared as above-described, each loaded with about 30 pounds of gun cotton.

On going upon the range, one of the members of the board went in the *Wahneta* to a position abreast the target and distant from it about 500 yards; the other members of the board remained on the *Vesuvius*. A steam launch containing an officer with apparatus for photographing the point of fall was stationed abreast the target and distant from it about 800 yards. This launch was to leeward of the target, while the *Wahneta* was to windward, the wind being from the eastward across the line of fire with a velocity of about 8 miles an hour. The observers were at their stations on the base line at Hilton Head.

The middle gun was first used with a valve setting which, by Lieut. Schroeder's curves, should give a range of 2,000 yards for that gun. The projectile containing a fuse fitted with delay-action composition train was discharged near the 2,000 yard mark. It ranged about 2,000 yards and plunged beneath the surface of the water without making any noise that could be heard on the *Wahneta*; no explosion could be discerned. The *Wahneta* returned to the *Vesuvius* immediately after observing this shot.

It was then determined to fire the port gun loaded with a projectile in which the delay-action composition had been removed from the fuse, and the channels thus emptied had been filled with sporting powder. Mr. John Rapieff was asked if he desired to go to the target end of the range of the *Wahneta* and witness the fall of the projectile, and having accepted, the *Wahneta* returned to her position abreast the target with Mr. Rapieff and one member of the board. The projectile was discharged from a position quite near to and abreast of the 2,000-yard mark, the valve-setting being used which, according to Lieut. Schroeder's curves, would give a range of 2,000 yards for that gun. At the end of its flight the projectile entered the water in about the usual way; no noise was made at its entrance, neither was there anything unusual in the splash caused. No explosion was heard by the observers on board the *Wahneta*, which vessel then returned to the *Vesuvius*.

It was then determined to fire a third shot, the fuse to contain delay-action composition, but having the primer case filled with gunpowder instead of compressed dry gun cotton. The object of this change was to eliminate the dry gun cotton primer, as it was considered possible that no action had taken place in the two previous rounds, and therefore it would be well to try gunpowder instead of gun cotton between the fulminate and the charge of the projectile, although it can not really be said that anymore favorable action was expected than before. The members of the board then exchanged places, the one on board the *Wahneta* going to the *Vesuvius* and the other two going to the *Wahneta* with Mr. John Rapieff, who had meanwhile been aboard the *Vesuvius* to attend to the preparations of the fuse and primer. The *Wahneta* then went to the target end of the range and took up her position as before.

The shot was fired with a valve-setting that, by Lieut. Schroeder's curves, should give a range of 2,000 yards for that gun. The projectile entered the water in the usual manner, and with the usual splash, no noise whatever was heard on the *Wahneta*, neither was any indication of an explosion seen. This round concluded the day's firing, and the vessels returned to the neighborhood of the *Philadelphia* and went up to the naval station later.

The most striking thing connected with this day's firing was the fact that most of the observers heard no noise when the projectile came in contact with the water, while on the two former days of the practice off Hilton Head the noise had been heard each round, at the time of the projectile's entrance into the water, not very unlike the report of a musket, only somewhat louder, and with more volume. The observers on the *Wahneta*, as also those aboard the *Vesuvius*, did not hear this noise to-day, but the officer in the steam launch and the signalman at the nearest station on shore considered that they heard it—the former was positive. These persons were to leeward of the point of fall, and those in the *Wahneta* were to windward, but as the wind only had a velocity of about 8 miles an hour the fact of position does not seem important. It having been suggested that the acoustic conditions of the air might not be the same on this day as they were on the occasion of the former two days' practice, it was concluded to try an experiment for clearing this point. Two members of the board pulled off to windward of the *Philadelphia* to a distance of about 500 yards, which is the distance at which the *Wahneta* held herself from the target during the practice. When in this position a Lee rifle was several times discharged from the poop of the *Philadelphia*, the piece being directed about at right angles to the line connecting the rifleman and the boat. The reports of these discharges were all distinctly heard from the boat, and it was thought at the time that the noise heard when the projectile torpedoes struck the water on the first two days' practice off Hilton Head on the 10th and 11th instants had more volume and was about three times as loud as the rifle reports just listened to.

The following table shows the results of the firing of the 11th and 14th instants:

Gun.	Valve-setting.	Range.		Difference between columns A and B.
		A.—As shown by Lieut. Schroeder's range curves.	B.—Mean obtained by board February 11 and 14.	
		Yards.	*Yards.*	
Port	367	2,000	2,010	10 over.
Middle	355	2,000	1,988	12 short.
Starboard	384	2,000	1,921	79 short.

February 15 the board proceeded to the U. S. Naval Station and held a meeting on board the *Vesuvius* at which it was decided that an experiment should be made with one of the fuses (see drawing appended, marked II), as follows: the object being to ascertain whether any failure to ignite probably occurred between the percussion-cap *z* intended to be detonated by the ball B and the charge of the torpedo. For this purpose it was necessary to remove the ball which did not enter into the investigation. A hole about one-eighth inch in diameter was drilled through the plug &, to communicate with the powder-chamber E, and this chamber, as also the passages leading from it to the flash-chamber *1*, were filled with sporting powder; the rest of the fuse was prepared as usual, the time composition being in place and the flash channels filled with sporting powder. The fulminate capsules *g g* were also in place. A wisp of collodion or photographers' cotton was placed in the chamber 2, and the dry gun-cotton primer G was screwed into place. The compressed dry gun cotton contained in this primer-case was pierced longitudinally with an axial hole about three-eighths inch in diameter. The fuse thus prepared, with about 4 feet of slow match inserted in the hole drilled in the plug &, was placed inside of a very thin old boiler on shore, and rather over a pound of compressed wet gun cotton was placed closely around the primer-case. The slow match was then lighted, and at the proper time the primer-case detonated with what was considered a rather dull report. Upon examination it was found that those parts of the fuse that were under trial had functioned properly, the large part of the fuse-case being broken and distorted and the primer-case blown into pieces averaging from an inch to half an inch square. The boiler was not very much injured, but one piece of the primer-case was driven through one of the crown sheets of the furnace. Only a few morsels of the wet gun cotton and none of the dry gun cotton could be found. All the channels of delay time composition had burned properly and the powder in the flash channels was consumed; however, it was the opinion of the board that complete detonation of the dry primer and of the wet gun cotton placed around it had probably not occurred, owing to the comparative dullness of the report as before mentioned. It was, therefore, determined to exhibit the sharpness of the report, that ought to result from the complete detonation of gun cotton arranged as in the experiment just tried, by detonating in the same boiler a volume of compressed dry gun-cotton equal to that of the dry and wet used in performing the previous experiment. The gun cotton was inclosed in a tin can and was detonated by five fulminate caps, containing in all 40 grains, set off by means of a slow match. The report was at least four times louder and much sharper than that obtained on the previous occasion. On examination of the boiler it was found to be much more injured by this than by the preceding shock, the sides being bulged out and partially separated from the front in the neighborhood of the place occupied by the gun cotton. The opinion was, therefore, confirmed that in the previous experiment the detonation of the gun cotton had not been of the first order. In this last experiment a small piece of dry gun cotton was picked up uninjured.

It was now determined to substantially repeat the first experiment, but to attempt to obtain complete detonation of the dry primer and of the surrounding wet gun cotton. For this purpose a fuse was prepared as on the first occasion, excepting that the axial hole in the primer of dry gun cotton was nearly filled with compressed dry gun cotton, and the channel 3 and the space 4 were also filled with compressed dry gun cotton The idea had been advanced that on the occasion of the previous experiment with the fuse, the vibrations due to the detonation of the fulminate *g* had been cushioned by the air in the axial hole of the dry gun-cotton primer, as well as in the empty spaces 3 and 4, thus causing the imperfect detonation above mentioned. It was, therefore, hoped that by filling all these spaces with compressed dry gun cotton the detonation of the fulminate *g* might be more perfectly conveyed to the primer and thence to the wet gun cotton surrounding it, which latter was placed around the primer case in the same manner as in the first experiment.

Thus arranged the fuse was placed in the same boiler and ignited as before. Only a slight snapping sound occurred, and, on investigation, it was discovered that the powder in the chamber E, and in its side channels, had been exploded, and that the delay time trains had also burned, but that apparently the residuum from these trains had wholly, or partially, clogged the narrow channels between them and the flash channels. It was also found that the powder in the flash channels, which had been placed there in New York about a month previously, was caked; however, on priming these channels with sporting powder, and lighting the priming with slow match, the powder in half the channels exploded; that in the other channels remained as before. The action of the fuse did not extend beyond the lower ends of the time trains, and of course the fulminate in *g* and the compressed dry gun cotton in 3, 4, and G were unaffected.

The board then returned to the *Philadelphia*, but sent back a communication to Lieut. Schroeder stating that, if Mr. John Rapieff so desired, the constricted channels between the time composition and the flash channels might be enlarged in one of the fuses. February 16 the *Vesuvius* got upon the firing range off Hilton Head about 9 a. m., the observers being in place and the starboard gun being loaded with a projectile containing 200 pounds of compressed wet gun cotton. The fuse was arranged as shown in the appended drawing and description marked H, except that the delay action composition in one-half of the time channels was removed and replaced by pieces of "Climax" fuse. The axial hole in the dry gun-cotton primer G was completely filled with compressed dry gun cotton, as was also the axial channel 3 and the conical space 4. The powder in the flash channels having been found to be somewhat caked, it was removed and replaced by sporting powder.

The valve being set for an opening which, according to Lieut. Schroeder's curves, would give a range of 2,000 yards, the vessel was run at a speed of 16½ knots per hour, and the gun was discharged when abreast the 2,000-yard buoy. The projectile ranged 1,975 yards and plunged under water as usual, but did not reappear; no indications of explosion or detonation were observed, though there was abreast the target a launch distant 800 yards containing an officer. This officer heard the usual slap or report that he says always occurs when a projectile, either loaded or unloaded, strikes the water. The observer at the nearest station on Hilton Head also heard the same report. A second round was fired under the same conditions as the first, except that the channels in the fuse stock that connect the time composition with the flash train were enlarged from 0.53 Brown and Sharp gauge to 0.81, same gauge. Two of the board and Mr. John Rapieff then went on board the *Wahneta* and took up a station 600 yards from the target and abreast of it. The shot was fired from the middle gun with the same setting as in previous rounds at 2,000 yards. The vessel was run at a speed of over 15 knots, and the gun was discharged when abreast the 2,000-yard buoy. The projectile ranged 2,064 yards, entered the water as usual, did not reappear, and no indications of an explosion were observed. On the first of the rounds above mentioned the officer in charge of the *Wahneta*, which was abreast of the target and 1,000 yards distant from it, thought that he heard an explosion, but no other observer considered that such was the case. The board also thinks that this officer was mistaken, as he said that the supposed explosion appeared to him to run along the surface of the water, which is not in accordance with the appearance of such explosions.

After some discussion it was determined to fire a shot at a range of 1,000 yards, so as to make it strike upon a large flat area of hard sand, exposed on the eastern side of Bay Point by the falling of the tide. It was hoped that this would be a crucial test of the functioning of the fuse generally, and, furthermore, if the fuse worked properly an exhibition would be had as to the complete or partial detonation of the wet gun-cotton charge of the projectile, it having been suggested that perhaps the 8-ounce dry gun-cotton primer would not effect complete detonation of the 200 pounds of wet compressed gun cotton forming the torpedo charge. A doubt had also been intimated as to whether the the 48 grains of fulminate placed at *g* would completely detonate the dry gun-cotton primer G. The fuse placed in this projectile was prepared in all respects like that in the projectile just fired.

The shot was fired and struck the sand at the desired point; the angle of fall was about 15° from the horizontal; after digging a trench in the sand about 14 feet long and 1 foot deep, it ricochetted, making a jump of 43 yards and landing upon its point with its axis nearly perpendicular to the horizon, thence it jumped about 5 yards, landing upon its base at an angle of about 30° with the horizontal, and making an indentation in the sand about 18 inches deep and 6 feet long, thence it jumped about 12 yards and fell upon its side, the point toward the front, without any explosion taking place. Part of the rotation wings were torn from the rear end at the first contact with the sand, and one or two other pieces came off at the other points of impact. The rear part of the rear section of the body was considerably flattened and slightly bent; the rest of the projectile appeared to be entirely uninjured. The nut in the head, that covers the fuse, was a little loose; this was removed and the fuse and dry primer were carefully taken from the projectile. The fuse was found to be uninjured, except that the finger spring *b*, for confining the ball B in its seat, was broken on both sides, once at *b* and also at *k k*. The print of the base of the nipple *z* was found to be impressed upon the copper of the fulminate cap *q*, and the pin *w* was sheared. As the weight of the nipple *z* seems hardly sufficient to have sheared this pin by inertia, it was thought by the board that the ball B may have pressed against *z*, though why without sufficient force to explode *q* is not quite apparent, unless the momentum of B was in some way overcome by the effort required to break the finger spring at *b* and *k k*. The extreme end piece *b* of the finger spring was found jammed between the guide block *d* and the body of the fuse stock, thus preventing the sleeve A from going forward more than about one-tenth inch beyond the position shown in the drawing. The pins *f f* were sheared, and the pins *m* and *u* had worked properly. The rest of the fuse, including the fulminate chamber *q* and the dry primer G, was entirely uninjured. More than half of the percussion plungers V had struck the extension of the sleeve and two or three times at about *u u*, showing that the sleeve had moved forward returning the blow. Pending the next step to be taken, the *Vesuvius* anchored near the *Philadelphia*, and the *Wahneta* was sent to Beaufort, and then to the naval station to take in coal.

February 17, during the forenoon a fog prevailed and no practice was possible. About 2 p. m. the weather cleared and the board landed on Bay Point, having previously directed the *Vesuvius* to prepare a fuse with the percussion nipples *a* removed, but otherwise all parts of the fuse to remain as usual. The intention was to throw a projectile armed with fuse upon the hard sand on Bay Point at a range of about 1,000 yards for the purpose of exhibiting the action of the sleeve A and the percussion ball B, and with the expectation, if these worked, of getting an exhibition of the action of the rest of the fuse. About 3 p. m. the projectile was fired, striking upon the beach as intended. It plunged beneath the surface of the sand about 3 feet, ranged through thick mud and sand, reappeared and ran close under the surface for about 20 feet, and then disappeared, ranging downward at an angle of about 5° below the horizontal, the total distance from the first point of impact to the point of rest, just below the surface, being about 50 feet. No explosion occurred. The projectile was dug up, and finding that the fuse could not be extracted readily, owing to the head being badly flattened on one side, the head was removed from the body, the wet gun cotton was taken from it, and the head, with dry primer G attached, was taken aboard the *Vesuvius* to be dismounted. Previously to this, the nut and handle had been removed from the front of the fuse, as also the anvil X. It was found that the nipple *z* and the pin *w* were uninjured, that the ball B had not moved from its seat, the fingers of the spring *b* retaining it in the usual position when at rest. The remaining parts of the fuse could not be seen, the sleeve A, with its attachment *d s* D, had apparently not moved.

After this a fuse was fitted into the loaded projectile which was fired on the beach yesterday, and which still remained there. The ball B and the anvil *x* plate X and time train were removed from this fuse, the place of latter being supplied by sporting powder, of which a quantity was also placed in the flash chamber 1. Upon this powder a service igniter was placed, its leading wires being brought through a hole made in the covering nut, on the nose of the projectile. The leading wires were then spliced to about 500 feet of insulated wire which was taken to a Farmer's C machine. The usual dry gun-cotton primer G was attached to the inner end of the fuse, having the axial hole filled with dry compressed gun cotton, as was also the conical space 4 and the canal 3. The intention was to develop the action of the dry gun cotton primer G upon the mass of 200 pounds of compressed wet gun cotton in the body of the projectile. The projectile was placed in a trench dug in the sand, about 3 or 4 feet in depth.

The igniter being fired, an explosion of small volume was obtained. Pieces of the forward end of the steel torpedo case being thrown from 50 to 130 or 140 feet. Upon examining the projectile it was seen that the flange of the head, at its junction with the body, had been burst into several pieces, the head itself being buried in the sand and mud at one end of the trench, was not recovered. A few small pieces of the primer case G and of its external copper sleeve were found. It was considered that no part of the wet gun cotton charge of the torpedo had been detonated, as about 4 feet of the case which was uninjured was packed full of it, and a great quantity of disks, sufficient to about fill the part of the case that was destroyed, lay in and about the trench. They were quite uninjured and some of them were warm to the touch. This experiment showed that possibly the dry gun cotton primer G is not sufficiently powerful to detonate the wet gun cotton charge of the torpedo. It is, of course, possible that the primer G was itself not detonated, but in the opinion of the board, it was.

February 18, a gale prevailing from the northwest, and landing on Bay Point being impracticable, the board visited the *Vesuvius* for the purpose of examining the fuse taken from the projectile fired upon the sand yesterday afternoon. It was necessary to cut the head of the projectile in order to remove the fuse, when it was found that the pins *f f* had not sheared, that the ball B had not moved, and that all parts of the sleeve D S *d*, with the pins *m n* and spring S, remained as shown in the drawing H. Two of the percussion plungers, V, had struck the sleeve A with great force, deeply indenting it, and bulging it inward *very* slightly directly underneath their points of impact. It was thus evident that the fuse had not functioned at all on its departure from the gun, possibly owing to the pins *f f* being too heavy.

The board asked Lieut. Schroeder whether he thought that a successful exhibition of the detonation of a projectile fired over the range into the water could be given. To which he replied, in effect, that he thought as the projectile is now arranged it could not, but that if certain changes were made in the dry gun cotton primer, the position of the fulminate for detonating it, and in the shearing pins in the sleeve A, he was of opinion that detonation could be produced. Capt. Rapieff was then similarly questioned, and replied virtually to the same effect. In further conversation he stated that he considered the explosion of several of the gunpowder charges, or of the gunpowder primers, or of the fulminate used in the torpedoes and fuses, had been obtained sometimes during the practice, basing his opinion upon the noises called "reports," usually heard when the torpedoes struck the water. He was reminded that he had made numerous experiments with the shearing pins before the practice began, and had professed himself satisfied with them. As has been before remarked, the noises called "reports," heard usually at the point of fall, are believed by the observers nearest the target, and by the board, to be caused by the projectile striking the water violently.

It is impossible to say positively that explosions may not have occurred at times, but the board did not see any appearance that it considered to be sufficiently certain indications of them. At any rate the board is decidedly of the opinion that the fuse in its present state is not well adapted for use in naval warfare on account of uncertainty of action, though it is conceded that it might probably be made so.

The board then returned to the *Philadelphia* and proceeded to consider its further course of action. It was decided that the projectile and fuse, as at present arranged, can not be depended upon for producing detonation, and that therefore it would be inexpedient to proceed to the towing trials (see paragraph 7 of the programme), which are the only trials of importance now remaining to be executed, unless the projectile and fuse are first so improved as to produce detonation with certainty. Consequently it was thought best to send a telegram to that effect to the commander-in-chief, which telegram was dispatched as follows:

ADMIRAL WALKER,
Metropolitan Club, Washington, D. C.

Fuse as presented not satisfactory. Delay time devices don't work with certainty. Seven gunpowder and nine gun cotton projectiles fired. No certain explosion yet. Board's experiments seem to show dry primers not large enough to detonate wet gun cotton; perhaps fulminate in fuse not properly placed. All uncertain.

Towing trials with bursting effects probably not possible without modification of fuse. Nine loaded projectiles left; no dummies. Under circumstances see little advantage in towing trials, but will await orders.

SICARD.

February 19 the Board directed a letter to be sent Lieut. Schroeder.

The following telegram was received from Admiral Walker in answer to the Board's telegram of yesterday:

WASHINGTON, D. C., *February 19, 1893.*

Capt. SICARD,
Cruiser Philadelphia, Port Royal, S. C.

Act at discretion about continuing trial.

WALKER.

February 20 the board landed at Bay Point and made the following experiments with the projectiles fired upon the Point on Thursday and Friday last, as already described. On Friday last an attempt had been made to detonate the first projectile fired upon the beach; this attempt had failed, but the forward end of the body of the projectile and its entire head had been injured by the detonation of the dry guncotton primer, leaving about 160 pounds of the compressed wet gun cotton in the uninjured part of the case.

Into the axis of this was inserted a service primer case filled with 2½ pounds of dry gun cotton, the upper end of which was flush with the top surface of the wet gun cotton. A service detonator was placed in the axial hole half way down the primer in the usual way, and the projectile thus prepared was placed in a trench about 2½ feet in depth, and was detonated by a Farmer's C machine. The detonation appeared to be complete; a large column of black smoke and dirt was thrown up some 140 or 150 feet, a large crater about 25 feet in diameter was made in the sand, and the torpedo case was entirely destroyed, pieces of it being thrown 400 paces; all the gun cotton seemed to have disappeared.

After this the projectile that was fired upon the beach on Friday last was prepared as follows: A service dry gun-cotton primer was placed in the axis of the wet gun-cotton charge of this projectile, directly under and about 1 inch below the base plug of the Rapieff fuse; the space between the upper disk of dry gun cotton and the bottom of the base plug of the fuse was filled with compressed dry gun cotton, as was also the conical hole in the lower face of the base plug. The Rapieff fuse, armed with 48 grains of the fulminate, was then placed in the head in the usual position, and was prepared for firing the time trains by means of the service detonator, the same way as described for the experiment on Friday last, excepting that in this case the hole in the base plug of the fuse for transmitting the shock of the detonation of the fulminate to the dry primer was increased in diameter from 0.25 inch to 0.4 inch, thus about doubling its area. The projectile was then lowered into a trench about 2 feet deep, and the service detonator being placed near its head, was detonated by a Farmer's c machine. The detonation of the dry primer was thought to be of the second order only; the part of the torpedo case about it was broken up and partly scattered; the head of the torpedo was projected about 50 feet, striking and splitting in its course a block of timber about 14 inches square and 3 feet long.

About two-thirds of the wet gun cotton composing the main charge was found in the case entirely uninjured, and a considerable number of blocks, which had been underneath the dry primer in the body of the projectile, were driven violently into the sides and bottom of the trench; no detonation of the wet gun cotton was obtained.

In the evening the board held a meeting on board the *Philadelphia*, at which it was concluded that the fuse had substantially failed, though it was thought to be capable of improvement.

It was decided that no more moving trials and no towing trials (paragraphs 6 and 7 of programme) should be attempted on account of the uncertainty of action of the fuse, and also to the opinion of the board that no detonations had been obtained by its use.

After an extended discussion as to the proper measures to be next adopted for the purpose of determining more fully the value of the pneumatic system as installed in the *Vesuvius* for naval warfare, it was decided to fire some projectiles for range at about 1,000 yards, it being considered that more data were very desirable for determining more exactly the probable rectangle of the guns at that range. Directions were therefore sent to Lieut. Schroeder to unload three of the gun-cotton projectiles, preparatory to weighting them with wood and cement for use in ranging.

February 21 the board held a meeting on board the *Vesuvius*, at which it was decided to unload all of the loaded projectiles, to fill seven of them with wooden disks, sand, and iron until the weights and positions of the centers of gravity would be virtually the same as those of the loaded projectiles, and to keep the remaining two empty for the present. The necessary order was accordingly given to Lieut. Schroeder.

Mr. John Rapieff having requested permission to go home, and the board having no further occasion for his services, he was discharged. He however left his machinist, Mr. Gunlock, for the present.

February 23 the board met on board the *Vesuvius*, and, finding that the projectiles had been prepared as mentioned above, proceeded to fire them over the range as follows, the same observers occupying the same stations that were used in the former practice over the range.

Gun.	Valve setting.	Range expected by Lieut. Schroeder's curves.	Range attained.	Difference.
		Yards.	*Yards.*	*Yards.*
Starboard	499	1,000	992	8 short.
Port	486	1,000	953	47 short.
Port	486	1,000	981	19 short.
Port	486	1,000	1,034	34 over.
Starboard	445	1,500	1,535	35 over.
Port	470	1,500	1,484	16 short.
Middle	439	1,500	1,482	18 short.

The wind during this practice was light on the starboard bow of the vessel.

The chief object of the above practice was to obtain more information regarding the accuracy of the guns for the ranges at which the probable rectangles appeared from the previous practice to be largest, and the above results were incorporated with those previously obtained, and were embodied in the tables on accuracy appended, marked P and Q.

The under water run of the projectiles during this practice was observed by two members of the board in a boat which was held abreast of and near to the point of fall. Besides this the angles between the splashes of impact and the last appearance of foam upon the water indicating the end of the torpedo's under water run were measured by a theodolite by an observer placed at the station most nearly perpendicular to the line of fire at the range being used. At this station an observer was angling for the range. The observers in the boat had unusually good opportunities for valuing the length of the under water run, as they were quite close to the point of fall and several times ran up to it with the boat very shortly after the projectile entered the water. The results obtained were as follows: By the theodolite observations the under water run was 27 yards for the 1,000-yard range and 45 yards for the 1,500-yard range, four observations for the former and three for the latter, whereas the estimates of the members of the board averaged 42 yards for both ranges, this seven rounds being estimated on. It is thought that the board's estimate is the more reliable in this case, as the members were so near the track of the projectile and compared its length with that of their steam launch, sometimes running directly through the spot left on the water by the ebullition caused by the torpedo in its under water travel, whereas the observer with the theodolite was distant 300 yards from the points of fall for the 1,000-yard range and 550 yards from those of the 1,500-yard range. At these distances it is thought that he probably could not well distinguish the line of comparatively faint foam and bubbles marking the latter part of the projectile's run, but which was quite evident from the boat.

No projectiles leaped from the water during the practice, and usually the foam track or wake was nearly continuous from the point of fall, being at first separated into spots with only a few yards of smooth water interval between them. The projectiles themselves were not seen at any time after entering the water. The points of fall were photographed as usual.

But little or no noise or report was made by the projectile that entered the water at the range of 1,000 yards, but those falling at 1,500 yards made a report about as loud as the firing of a large pistol; there was a little more sea on at this latter time, but of course only slight. The observers were to windward of the *Vesuvius*, the speed of wind being about 8 miles an hour. The reports of the *Vesuvius* guns were rather faint, and if the attention were fixed upon the descending projectiles the reports of the guns would generally not be heard.

On the conclusion of this practice, the board proceeded in the *Vesuvius* to the range off Hilton Head, and there fired two shots at a range of about 2,000 yards, the object of this practice being to test the workings of the percussion ball in the fuse.

These two projectiles had each been loaded with 100 pounds of gun powder, the copper case, into which the dry gun cotton primer case usually fits, being filled with cannon powder in a serge bag, the 100 pounds lying immediately outside this copper case.

The fuse with the dry gun cotton primer case G removed was then screwed into place.

The first round was fired and it was observed by the board from the bridge of the *Vesuvius;* the splash was a rather large one, but no explosion was heard. Before the firing of the second round the board proceeded in a steam launch to the farther end of the range and stationed themselves abreast of and about 400 yards from the point of fall, from which position everything could be distinctly seen. The wind was toward the point of fall, velocity about 8 miles an hour. On striking the water the projectile threw up a good jet, but no explosion was heard.

This ended the tests of the *Vesuvius* pneumatic guns, the projectiles being all expended.

The board returned to the *Philadelphia*, and Lieut. Schroeder, commanding the *Vesuvius*, and Ensign W. H. Dodd, commanding the *Wahneta*, were relieved from duty connected with the tests.

CONCLUSIONS.

In the endeavor to determine the value for naval warfare of the pneumatic guns for discharging torpedoes, installed on board the *Vesuvius*, the question of accuracy attracts most attention, and a discussion of this quality will be found appended, marked I, where the probabilities of hitting a typical target for different ranges are tabulated. The "probable rectangles" and other qualities could have been more perfectly found had the data been fuller, but they are correct enough to fairly exhibit the qualities of the guns as they now stand on board the vessel, and all the available data were used.

Thirty-one of the projectiles fired by the board for range were "dummies," and twenty-one were service projectiles, which, being turned on the outside, are smoother than the dummies. This difference of surface may perhaps affect the range somewhat, but its influence, if any, did not appear.

After an extended consideration the board has decided that while the accuracy of these guns leaves a good deal to be desired, it is still reasonably sufficient for the purposes of naval warfare in comparatively smooth water, the only condition under which the board has been able to carry on the tests.

The value of the guns is increased by the fact that the projectile contains a heavy charge of high explosive, and also that this explosive can be safely discharged when the projectile that contains it is armed with a fulminate fuse; and though the particular fuse used in the trials has failed to perform its functions properly, it is evident that it can be safely fired from the gun.

One of the chief merits of the system is that its usefulness begins at about the range where that of the automobile torpedoes now in vogue ceases; and while it is true that daylight is necessary in order to best utilize these ranges, it is thought that a vessel so armed would still be useful at night for annoying groups of hostile ships, firing upon harbors, dockyards, etc.

The usefulness of the system at night is increased by the fact that there is no flash or smoke from the guns, and that the report when projectiles are used is comparatively light; indeed, with the vessel to leeward, or if a side wind of moderate force should prevail, it is doubtful whether the report would be much noticed. In the daytime a vessel carrying such guns could successfully attack under cover of fog or smoke, or under the shelter or protection of our armored or other ships;

she could also be conveniently used in rivers or bays by firing from behind trees or points of land, from which positions she would be able to make fair practice (see tables of probable rectangles and probabilities of hitting, appended, marked P and Q); and owing to the absence of smoke would not be so readily discovered as other vessels.

The board is aware that the firing of high explosives from powder guns of late years has made progress, and very likely before long the firing of heavy charges from such guns may be generally introduced; and, if so, it is quite probable that the value of the pneumatic guns may be lessened; but it is to be observed that such powder guns have not yet made their appearance in the Navy, and it is uncertain when they will do so. When they do appear, perhaps they may prove to be simpler in mechanism and more accurate in practice than the guns of the *Vesuvius;* but the board has no positive evidence on this point at present, and therefore is uncertain to what extent this superiority may obtain, and are also uncertain to what extent the pneumatic system may be improved. In order to form a judgment as to the comparative accuracy of the two kinds of guns, it would be well to compare the probable rectangles, etc., of the pneumatic guns with those of a rifled mortar or howitzer that would project equal weights of high explosive over equal ranges. But however these matters may ultimately be decided, the board is of the opinion that the pneumatic system as installed on board the *Vesuvius* is, on the whole, of decided value in naval warfare, though the fuse is quite defective and several other points connected with the mechanism of the guns require attention. It is also thought, judging from the comparatively superior endurance of the middle gun, that the system is capable of mechanical improvement, and that the guns can probably be made to work more nearly together than they do now. The board has observed the following points in which improvement would be desirable as tending to the more perfect working of the system:

The fiber buffers used in the mechanism do not appear to resist well the hammering of the parts which they cushion; they also appear to swell and flake when much moisture is present, and thus the range and accuracy of the guns is injuriously affected. The buffers should, if possible, be made of some harder and more durable substance.

It would be well if some means were taken to prevent the entrance of undue amounts of moisture into the system, as the presence of moisture affects the buffers as above mentioned.

Valves should be provided to isolate each gun from the others, and from the firing reservoirs, in order that a disabled gun could be thrown out and repaired while the others were in use.

The board does not understand that it is required to report upon the vessel herself, but only upon the pneumatic system as installed on board of her

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We are, very respectfully, your obedient servants,

MONTGOMERY SICARD,
Captain, U. S. N., President of Board.
ALBERT S. BARKER,
Captain, U. S. N., Member.
ARTHUR P. NAZRO,
Lieutenant, U. S. N., Member.

Rear-Admiral J. C. WALKER, U. S. N.,
Commanding U. S. Naval Force, North Atlantic Station.

I.

ACCURACY.

The value of the pneumatic guns as installed on board the *Vesuvius* depends mostly upon their accuracy, and the board has made every effort to ascertain to what extent they possess this quality.

The shooting on January 31 and February 1, 3, and 6 was done over the range used by Lieut. Schroeder in determining his range curves under paragraph 1 of the program. In this case the vessel was secured to a dock at the U. S. Naval Station, the firing was down Beaufort River, and the points of fall were taken by experienced observers on the banks of the stream, their stations being a part of those occupied by Lieut. Shroeder during his ranging practice. The plat of this range, showing the observing stations, is appended, marked M.

It is traced from the plat used by Lieut. Schroeder, and it will be perceived that favorable angles can be obtained at any point along the range. One observer was placed with a theodolite on the wharf nearly in the line of fire at the station "ship;" two others, also with theodolites, occupied the two stations most favorably situated for angling on the desired point of fall.

An officer in a steam launch with a camera usually held himself abreast of the points of fall of the projectiles and as near to them as seemed safe, and endeavored to get photographs in each case, as nearly as possible, at the moment of contact of the projectile with the water. This was done for the purpose of determining the angles of fall. During part of the practice, members of the board went down the range in a boat and observed the flight of the projectiles both above and below the surface of the water, and observers upon the river bank were also at times charged with this duty. The weather during the ranging practice on the dates above mentioned was calm and smooth.

Fourteen of the shot fired for accuracy were used on another range, laid out off Hilton Head Island. This change of location was made in order that loaded projectiles might be used in the practice, which would have been dangerous to those living in the vicinity of the first range, where dummy projectiles only were used.

A plat of the Hilton Head range is appended, marked N. The base line is a mile long, the angle out of the nearest station being about 90° and that of the other about 45°. During the practice the *Vesuvius* was held near a small buoy by means of her engines, and all the shooting was at about 2,000 yards. The weather was fine and smooth with but little wind. The valve settings were obtained from Lieut. Schroeder's curves, and were the same for each gun as those used at the Navy-Yard range. All the projectiles fired at Hilton Head were "service." The time of flight at both ranges was obtained with a stop watch marking one-fourth seconds. Photographs of the angles of fall were also attempted off Hilton Head, and the under-water run was observed as far as practicable.

During the first part of its flight, the projectile has not taken up rotation, and consequently its axis does not remain tangent to the trajectory, but inclines to it slightly at different angles and on different sides. This movement of the axis may be gyratory, and is best observed from a position in rear of the gun and near the plane of fire. After flying about 100 yards, rotation becomes distinctly visible and increases rapidly, while at the same time the movements or gyration of the axis appear to become less, and on the falling branch at the larger ranges seem to disappear. This gyration is not thought to very materially affect accuracy at 1,000 yards and perhaps not even at 500 yards, as the projectiles seemed to fly well, and struck the water point first at all ranges during the practice.

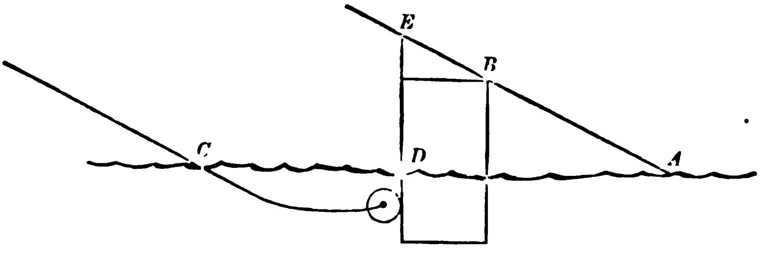
The behavior of the projectile after striking the water was noted by a number of persons, including members of the board, from boats near the line of fire and sometimes from the shore. Towards the end of the flight the axis of the projectile seemed about tangent to the trajectory, though it was difficult to judge of this point by observation only. The difference between the inclination of the axis to the horizontal at different ranges was very difficult to value, by eye, within the brief space of time allowed for observation.

About 32 attempts were made to obtain photographs of the projectile for angles of arrival (at the point of fall), and owing to the extreme difficulty of making the observation only 9 pictures were obtained, and of these only 4 could be used—1 at about 2,000 yards, 2 at about 1,000 yards, and 1 at about 500 yards. They are appended, marked O. For valve settings, that by Lieut. Schroeder's curves should give ranges of 2,000 yards, 1,000 yards, and 500 yards. These photographs gave angles of fall of about 21°, 16½°, 15½ respectively, which were used in making the computations on the probability of hitting—appended tables, marked P Q.

The first plunge of the projectile under water, at all ranges, was usually accompanied by more or less of a jet. At the range of 2,000 yards it rarely reappeared or gave any sign of its presence under the surface; sometimes, however, it showed a sort of wake, and occasionally leaped from the water in a ricochet. At 1,500, 1,000, and 500 yards the projectile showed more signs of its presence.

Usually, after the first plunge, a disturbance or boiling of the water would be observed at a distance of about 10 yards from the point of entrance, the water between these points being entirely undisturbed. After causing the boiling above mentioned, the projectile sometimes caused a second ebullition, smaller than the first and separated from it by a space of still water about 7 yards. It then caused a band or wake of boiling water to appear for some 14 yards more; at times this band appeared continuously from the first disturbed spot. Occasionally the projectile, after the first plunge, would disappear as above, and would then leap from the water, describing a curve more or less abrupt, after which it would either make another and smaller jump, or else would scurry along at or near the surface for a few yards, and then disappear. During these leaps it often deviated somewhat from the plane of fire. It is worth remarking that, though several of these leaps from the water were observed during the board's practice, it was said that none were noticed during the ranging practice made by Lieut. Schroeder; the scurrying of the projectile at or near the surface of the water was, however, always on this occasion observed. Doubtless the trajectory under water is undulating, but how deeply the projectile dives is uncertain, probably not over about 15 feet at the first plunge and less afterwards. As this under-water run is very important in valuing the effect of the projectile, the board gave much attention to its discussion, and finally concluded that an effective run of 30 yards could be depended upon at all ranges, and to this must be added the radius of destructive effect of the charge of 200 pounds of gun cotton, 7 yards, making a total of 37 yards (subsequently to fixing this length, observations referred to on page 109 body of the report, show that the effective under-water run is probably more than this, but the figure 37 has been retained in the computations as being on the safe side), which was used in computing the "probability of hitting" at the different ranges. The probable rectangles at each mean range attained in the board's practice, together with the probability of hitting at these ranges a hypothetical vessel of about the size of the *Philadelphia*, have been calculated, and are given in the appended tables, marked P Q. In these calculations all but six of the rounds are considered which were fired with valve settings taken from Lieut. Schroeder's range curves, but this, in fact, includes all the shots fired except eleven, part of which were experimental, and part were fired when the *Vesuvius* was running at a high rate of speed The data for the probable rectangles at the 2,000-yards range are considerably fuller than for the other ranges; this is owing to the fact that most of the practice had to be made at the longest range, in order to exhibit the greater or less reliability of the fuses.

The probability of hitting at the different ranges was obtained as follows: A vessel of about the length of the *Philadelphia*, a parallelopiped in form, with a breadth of 33 feet, height of rail 20 feet, and a draught of 20 feet, was selected for consideration. This breadth is equal to the mean beam of the *Philadelphia* at the spar deck, the height above water is assumed to be, roughly, the mean height of the *Philadelphia's* rail, exclusive of bridges, funnels, etc., while the depth is two feet less than her draught. The danger spaces of this target were then assumed to be as shown in the following figure, supposing the vessel to be placed at right angles to the plane of fire.

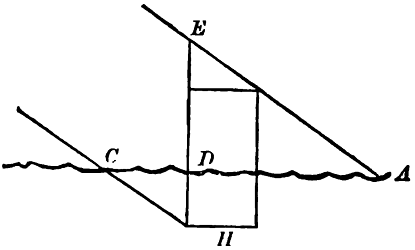


Let A be the angle of fall, B the highest part of the vessel that can be hit by the projectile, and C the farthest point at which a projectile entering the water can, by its combined under-water run and mine power damage the ship, provided the "delay action" time fuse burns throughout this run. Suppose the mean point of impact to be D, then the probability of hitting above water will be obtained on the vertical target D E, while the probability of hitting due to the under-water action of the torpedo will be obtained from the space C D *a*. As before remarked, this latter space was assumed to be 37 yards at all ranges.

The probability of hitting, as above, at the different ranges at which the board held its practice will be found in the table appended, marked P, the probability of hitting above water in column 8, under water in column 9, and the sum of these, which is considered to be the total probability, in column 10. The length of under-water run adopted is based upon the assumption that the "delayed action" fuses used in the torpedo will work properly.

If, however, it be considered that this fuse will not work, and that we may be compelled to depend upon a simple percussion plunger only, the probabilities of hitting for the different ranges have been computed from the following considerations:

Supposing, as before, that the plane of fire is perpendicular to the direction of greatest length of the vessel. It has been always noticed that when the projectiles plunge beneath the surface of the water they seem to run for a moderate distance at about the angle of entrance, and it is considered, as long as they strike the water within 15 yards of the vessel's side at the longer ranges and within 22 yards at the shorter ranges, that the torpedo is about certain to strike the vessel's bottom and to explode by percussion, provided an ordinarily efficient percussion fuse is used. Therefore, the vertical target upon which the probability of hitting should be computed, in this case, would be E H, A being the angle of the fall and D H the draft and C D the distance within which it is assumed that the projectile must strike the water in order to reach the vessel's bottom by direct impact. These results are included in the table appended, marked Q, and it will be seen that, even when the under-water run is thus restricted, the target presented by the ship's side is a good one and the probabilities of hitting are very fair.



In both of these tables the vessel is also considered as being presented longitudinally to the line of fire, and in this case the probability of hitting is, of course, considerably greater, being found in columns 3, 4, 5.

In all the practice the lateral deviation has been observed to be very small, and has consequently been disegarded in computing the probability, and it will be observed that in the tables the lengths only of the rectangles are given. On the plats of the points of fall appended, marked M N, the horizontal deviations appear to be considerable; but this is misleading and results from the fact that the vessel's head could usually not be held steadily on a single point, and, in fact, the direction of the line of fire varied considerably from time to time. The moderate winds that prevailed occasionally did not seem to affect the flight much. The weather was usually light.

P.

"Probable rectangles" and "probability of hitting" of the pneumatic guns of the U. S. S. Vesuvius, assuming that the under-water torpedo run and explosive effect of charge, regulated by proper time fuse, equals 37 yards.

Gun.	Number of shots used in calculations.	Range (expected).	Mean range.	Mean error in range.	Mean vertical error.	Side of probable rectangle.	Probability of hitting Philadelphia direct (athwartship.)	Probability of hitting —torpedo effect and explosion.	Total probability (athwartship).	Probability (end on).	Total probability (end on).
1	2	3	4	5	6	7	8	9	10	11	12
		Yards.	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
Starboard	8	2,000	1,954	44.75	19.92	118	.174	.238	.412	.496	.734
	4	1,500	1,491	33.5	12.2	84.1	.242	.318	.560	.59	.818
	4	1,000	935	59.5	17.6	145	.170	.186	.356	.457	.643
Middle	7	2,000	1,988	19	8.45	46.9	.352	.438	.790	.50	.938
	4	1,500	1,411	39	14	106.4	.219	.216	.435	.406	.622
	3	1,000	806	88	26	239.6	.137	.130	.267	.368	.498
Port	5	2,000	2,024	31	13.8	79.9	.24	.319	.559	.50	.819
	5	1,500	1,354	66	24	238	.137	.169	.306	.43	.599
	6	1,000	898	92	28	265	.114	.125	.239	.35	.475

Length of *Philadelphia* taken as 320 feet.
Beam (mean) of *Philadelphia* taken as 33 feet.
Height of *Philadelphia* taken as 20 feet.
Angle of fall for 2,000 yards taken as 24°.
Angle of fall for 1,500 yards taken as 20°.
Angle of fall for 1,000 yards taken as 16° 30′.
Under-water run taken as 30 yards. Radius of torpedo effect, 7 yards.
Mean point of impact taken at middle of water-line.
Extreme errors are taken as three times the mean error. Lateral errors being very small are not considered in the competition. The weather was generally clear, light airs, and calm.
It has been assumed that the under-water run accompanies every shot.

Q.

"Probability of hitting" of the pneumatic guns of the U. S. S. Vesuvius, assuming that no effect is obtained below water unless the torpedo strikes the vessel's side.

Gun.	Range.	Probability of hitting part above water (athwartship).	Probability of hitting part below water.	Total probability (athwartship).	Probability of hitting end on (above water).	Total probability of hitting (end on).	Number of shots.
1	2	3	4	5	6	7	8
	Yards.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	
Starboard	2,000	.174	.105	.279	.496	.601	8
	1,500	.242	.165	.407	.50	.665	4
	1,000	.170	.118	.288	.457	.575	4
Middle	2,000	.352	.219	.571	.50	.719	7
	1,500	.219	.145	.364	.406	.551	4
	1,000	.137	.081	.218	.368	.449	3
Port	2,000	.240	.148	.388	.50	.648	5
	1,500	.137	.088	.225	.43	.518	5
	1,000	.114	.078	.292	.35	.428	6

Draft taken as 20 feet. Beam taken as 30 feet. Length taken as 320 feet. Height (above water) 20 feet.
Mean point of impact taken at middle of water line. Lateral errors disregarded.

R 1.

Ranging practice by board.

Date.	Gun.	Valve settings.	Ranges expected.	Ranges obtained.	Difference.	Remarks.
			Yards.	*Yards.*	*Yards.*	
1893—Jan. 31	Starboard	378	2,000	1,890	− 110	Beaufort River range.
	....do	384	2,000	1,858	− 142	Do.
	....do	445	1,500	1,466	− 34	Do.
	....do	445	1,500	1,449	− 51	Do.
Feb. 1	....do	499	1,000	886	− 114	Do.
	....do	499	1,000	864	− 136	Do.
	....do	560	500	131	− 369	Do.
	....do	535	500	514	+ 14	Do.
	....do	334	2,000	2,076	+ 76	Do.
6	....do	499	1,000	996	− 4	Do.
	....do	445	1,500	1,514	+ 14	Do.
	....do	384	2,000	2,019	+ 19	Do.
	....do	384	2,000	2,012	+ 12	Do.
10	....do	384	2,000	1,990	− 10	Hilton Head range.
	....do	384	2,000	1,975	− 25	Do.
11	....do	384	2,000	1,950	− 50	Do.
	....do	384	2,000	1,900	− 100	Do.
14	....do	384	2,000	1,930	− 70	Do.
16	....do	384	2,000	1,975	− 25	Do.
23	....do	490	1,000	892	− 108	Beaufort River range.
	....do	415	1,500	1,535	+ 35	Do.

R 2.

Ranging practice by board.

Date.	Gun.	Valve settings.	Ranges expected.	Ranges obtained.	Difference.	Remarks.
			Yards.	*Yards.*	*Yards.*	
Jan. 31	Middle	355	2,000	1,980	− 20	Beaufort River range.
	...do	355	2,000	1,963	− 37	Do
	....do	470	1,500	1,371	− 129	Do
	....do	470	1,500	1,386	− 114	Do
Feb. 1	....do	544	1,000	1,031	+ 31	Do
	....do	544	1,000	1,044	+ 44	Do
	.... do	659	500	532	+ 32	Do
3	....do	355	2,000	2,052	+ 52	Do
	....do	470	1,500	1,402	− 98	Do
	....do	544	1,000	990	− 10	Do
6	....do	355	2,000	1,962	− 38	Do
10	....do	355	2,000	2,015	+ 15	Hilton Head range.
	... do	355	2,000	2,015	+ 15	Do
11	....do	355	2,000	1,977	− 3	Do
14	... do	355	2,000	2,000	0	Do
16	....do	355	2,000	2,064	+ 64	Do
23	....do	470	1,500	1,484	− 16	Beaufort River range.

R 3.

Ranging practice by board.

Date.	Gun.	Valve Settings.	Ranges expected.	Ranges obtained.	Difference.	Remarks.
			Yards.	*Yards.*	*Yards.*	
Jan. 31	Port	367	2,000	2,016	+ 16	Beaufort River Range.
	...do	367	2,000	2,056	+ 56	Do.
	...do	439	1,500	1,471	— 29	Do.
	...do	439	1,500	1,351	— 149	Do.
Feb. 1	...do	486	1,000	866	— 134	Do.
	...do	486	1,000	878	— 122	Do.
	...do	542	500	20	— 480	Do.
	...do	437	1,500	1,441	— 59	Do.
Feb. 3	...do	367	2,000	2,070	+ 70	Do.
	...do	439	1,500	1,233	— 267	Do.
	...do	439	1,500	1,233	— 267	Do.
	...do	486	1,000	675	— 325	Do.
Feb. 10	...do	367	2,000	1,975	— 25	Hilton Head Range.
Feb. 11	...do	367	2,000	2,005	+ 5	Do.
Feb. 14	...do	367	2,000	2,015	+ 15	Do.
Feb. 23	...do	486	1,000	953	— 47	Beaufort River Range.
	...do	486	1,000	981	— 19	Do.
	...do	486	1,000	1,034	+ 34	Do.
	...do	439	1,500	1,482	— 18	Do.

J 1.

Record of settings of range valves and losses of air in firing reservoir during the trial of the pneumatic guns on dates of January 31 and February 1, 1893.

Date.	Gun.	Setting of valve.	Pressure by gauge. (Lbs. per sq. in.)			Projectile.			
			Initial.	Final.	Losses.	No.	Position of center of gravity from point.	Weight.	Kind. 10 inch sub. cal.
							Inches.	*Pounds.*	
Jan. 31, 1893	S^1....	378	750	685	65	59	42.37	514⅓	Dummy.
	M^1....	355	750	665	85	41	42.4	515⅓	Do.
	P^1....	367	750	678	72	42	42.56	516½	Do.
	S^2....	384	750	687	63	54	42.56	515	Do.
	M^2....	355	750	667	83	43	42.5	516	Do.
	P^2....	367	750	676	74	44	42.5	516¼	Do.
	S^3....	445	750	706	44	32	42.5	516¾	Do.
	M^3....	470	750	709	41	75	42.34	513¾	Do.
	P^3....	439	750	709	41	51	42.44	515½	Do.
	S^4....	445	750	712	38	36	42.56	516	Do.
	M^4....	470	750	709	41	47	42.62	515½	Do.
	P^4....	439	750	711	39	64	42.25	515	Do.
Feb. 1, 1893	S^5....	499	750	724	26	60	42.5	513	Do.
	M^5....	544	750	720	30	39	42.5	516	Do.
	P^5....	486	750	726	24	55	42.44	515⅓	Do.
	S^6....	499	750	726	24	38	42.5	516⅓	Do.
	M^6....	544	750	723	27	68	42.43	514¼	Do.
	P^6....	486	750	726	24	46	42.62	515¼	Do.
	S^7....	560	750	744	6	52	42.44	516	Do.
	M^7....	659	750	736	14	37	42.56	516¼	Do.
	P^7....	542	750	749	1	58	42.25	516⅛	Do.
	P^7....	542	750	749	1				
	P^7....	518	750	746	4				
	S^8....	535	750	736	14	53	42.56	515¾	Do.
	S^9....	334	750	674	76	34	42.5	516	Do.
	P^8....	437	750	710	40	40	42.5	516¼	Do.

(3)—J 2.

*Record of settings of range valves and losses of air in firing reservoir during **the trial on** February 3 and 6, 1893.*

Date.	Gun.	Setting of valve.	Pressure by gauge.				Projectile.				Remarks.
			Initial.	Final without projectile.	Final with projectile.	Loss.	Kind. (10 inch Sub. Cal.)	No.	Position of C. of G.	Weight.	
			Lbs.	*Lbs.*	*Lbs.*	*Lbs.*				*Lbs.*	
Feb. 3, 1893	M ..	500	750	718	......	32	....	....	....	....	
	M ..	400	750	700	......	50	....	....	....	....	
	M^{8}..	355	757	......	666	91	Dummy ..	48	42.5	515¾	Condition good. Gaschecks were taken off projectiles and the wrought-iron rod was driven up by sledge hammer and then the nose was examined to see if it was loose and all were placed in good condition. Gas checks were replaced.
	M ..	355	757	673	......	74	....	....	....	....	
	P ...	500	757	737	......	20	....	....	....	....	
	P ...	400	757	700	......	57	....	....	....	....	
	P ...	367	757	685	......	72	....	....	....	....	
	P ...	367	757	688	......	69	....	....	....	....	
	P ...	367	757	688	......	69	....	....	....	....	
	P ...	367	757	687	......	70	....	....	....	....	
	P^{9} ..	367	750	......	678	72	Dummy ..	57	42.5	515	Was loose, but was tightened.
	M ..	500	750	716	......	34	....	....	....	....	
	M ..	470	750	714	......	36	....	....	....	....	
	M ..	470	750	714	......	36	....	....	....	....	
	M ..	470	750	714	......	36	....	....	....	....	
	M^{9}..	470	750	......	708	42	Dummy ..	49	42.62	516	Condition good; set up on nose slightly.
	P ...	439	750	708	......	42	....	....	....	....	
	P ...	439	750	709	......	41	....	....	....	....	
	P ...	439	750	709	......	41	....	....	....	....	
	P^{10} .	439	750	......	715	35	Dummy ..	50	42.44	515½	Condition good.
	P ...	439	750	710	......	40	....	....	....	....	
	P^{11}..	439	750	......	715	35	Dummy ..	45	42.4	516½	
	M ..	544	750	735	......	15	....	....	....	....	
	M ..	544	750	729	......	21	....	....	....	....	
	M ..	544	750	729	......	21	....	....	....	....	
	M^{10} .	544	750	......	724	26	Dummy ..	31	42.56	515½	Tightened nose.
	P ...	486	750	729	......	21	....	....	....	....	
	P ...	486	750	729	......	22	....	....	....	....	
	P ...	486	750	729	......	21	....	....	....	....	
	P^{12}..	486	750	......	732	18	Dummy ..	56	42.5	516½	Condition good.
Feb. 6, 1893	S ...	500	750	718	......	32	....	....	....	....	
	S ...	499	750	720	......	30	....	....	....	....	
	S^{10}..	499	750	......	724	26	Dummy .	63	42.37	515	Do.
	S ...	445	750	706	......	44	....	....	....	....	
	S ...	445	750	705½	......	44½	....	....	....	....	
	S^{11}..	445	750	......	705	45	Dummy ..	65	42.5	515½	Do.
	S ...	384	750	688	......	62	....	....	....	....	
	S ...	384	750	682	......	68	....	....	....	....	
	S ...	384	750	682	......	68	....	....	....	....	
	S^{12}..	384	750	......	677	73	Dummy ..	35	42.4	516	Do.
	S^{13}..	384	750	......	679	71	Dummy ..	33	42.4	516¾	Do.
	M ..	355	750	673	......	77	....	....	....	....	
	M ..	355	750	666	......	84	....	....	....	....	
	M ..	355	750	664	......	86	....	....	....	....	
	M^{11} .	355	750	......	666	84	Dummy ..	67	42.31	516	Do.

Record of loss of pressure in firing reservoir and setting of range valves during trial on dates February 10, 11, 14, 16, 17, and 23.

Date.	Gun.	Setting of valve.	Pressure by guages.				Projectile.			
			Initial.	Final.	Loss without projectile.	Loss with projectile.	Kind.	No.	Weight.	
			Lbs.	Lbs.	Lbs.	Lbs.				
Feb. 10, 1893	S	384	750	677	73	......	......	......	......	Projectiles filled with 10 pounds Bickford cannon powder, and weight made up by putting in wood and cement. Dry gun-cotton primer.
	S^{14}	384	750	680	......	70	10-inch sub-cal.	2	514	
	M	355	750	668	82	......	......	......	......	
	M^{12}	355	750	668	......	82	10-inch sub-cal.	11	520	Do.
	P	367	750	684	66	......	......	......	......	
	P^{13}	367	750	684	......	66	10-inch sub-cal.	1	517	Do.
	S	384	750	678	72	......	......	......	......	
	S^{15}	384	750	680	......	70	10-inch sub-cal.	7	519	Projectile filled as above with powder in primer case.
	M	355	750	672	78	......	......	......	......	
	M^{13}	355	750	668	......	82	10-inch sub-cal.	25	518	Do.
Feb. 11, 1893	P	367	750	689	61	......	......	......	......	
	P^{14}	367	750	681	......	64	10-inch sub-cal.	23	*520	Fifteen pounds powder. Primer case filled with powder and pierced.
	S	384	750	692	58	......	......	......	......	Do.
	S^{16}	384	750	688	......	62	10-inch sub-cal.	4	*520	Powder bag instead of primer case.
	M	355	750	680	70	......	......	......	......	Do.
	M^{14}	355	750	676	......	74	10-inch sub-cal.	10	*520	Time train replaced by powder.
	S	384	750	684	66	......	......	......	......	Do.
	S^{17}	384	750	688	......	62	10-inch sub-cal.	15	*520	
Feb. 14, 1893	M	355	750	680	70	......	......	......	......	
	M^{15}	355	750	676	......	74	10-inch sub-cal.	13	*520	Thirty pounds gun cotton. Gun-cotton primer.
	P	367	750	682	68	......	......	......	......	
	P^{15}	367	750	686	......	64	10-inch sub-cal.	16	*520	Do.
	S	384	750	679	71	......	......	......	......	Time train replaced by powder.
	S^{18}	384	750	686	......	64	10 inch sub-cal.	20	*520	Thirty pounds gun cotton. Primer case filled with powder.
Feb. 16, 1893	S	384	750	683	67	......	......	......	......	
	S^{19}	384	750	683	......	67	10-inch sub-cal.	9	510½	200 pounds gun cotton.
	M	355	750	682	68	......	......	......	......	
	M^{16}	355	750	675	......	75	10-inch sub-cal.	22	511½	Do.
	M	544	750	729	21	......	......	......	......	
	M^{17}	544	750	729	......	21	10-inch sub-cal.	14	511½	Do.
Feb. 17, 1893	M	544	750	729	21	......	......	......	......	
	M^{18}	544	750	724	......	26	10 inch sub-cal.	24	519	Do.
Feb. 23, 1893	S	499	750	717	33	......	......	......	......	
	S^{20}	499	750	720	......	30	10-inch sub-cal.	12	517½	C. of G. 43.1. Projectile weighted with sand.
	P	486	750	721	29	......	......	......	......	
	P^{16}	486	750	722	......	28	10-inch sub-cal.	3	529	C. of G. 41.75 Projectile weighted with sand.
	P	486	750	719	31	......	......	......	......	
	P^{17}	486	750	721	......	29	10 inch sub-cal.	5	513½	C. of G. 42.9. Projectile weighted with sand.
	P	486	750	718	32	......	......	......	......	
	P^{18}	486	750	721	......	29	10-inch sub-cal.	8	515	C. of G. 43.5. Projectile weighted with sand.

* Approximate.

Record of loss of pressure in firing reservoir and setting of range valves, etc.—**Continued.**

Date.	Gun.	Setting of valve.	Pressure by guages.				Projectile.			
			Initial.	Final.	Loss without projectile.	Loss with projectile.	Kind.	No.	Weight.	
			Lbs.	*Lbs.*	*Lbs.*	*Lbs.*				
Feb. 23, 1893	S	445	750	700	50	......	......	......	......	
	S^{21}	445	750	703	......	47	10-inch sub-cal.	17	525	C. of G. 42.0. Projectile weighted with sand.
	M	470	750	716	34	......	......	......	......	
	M^{19}	470	750	706	......	44	10-inch sub-cal.	21	510	C. of G. 42.0. Projectile weighted with sand.
	P	439	750	704	46	......	......	......	......	
	P^{19}	439	750	708	......	42	10-inch sub-cal.	19	514	C. of G. 43. Projectile weighted with sand.
	M^{20}	355	750	666	......	84	10-inch sub-cal.	6	424	C. of G. 40. 100 pounds powder.
	P^{20}	367	750	676	......	74	10-inch sub-cal.	18	428	C. of G. 41. 100 pounds powder.

No. 10.

NAVY DEPARTMENT, BUREAU OF ORDNANCE,
Washington, D. C., April 11, 1893.

SIR: In compliance with your letter 2045 of April 7, 1893, a copy of which is inclosed herewith, we have the honor to make the following report of the trial of the Sponsel 1-pounder gun, held under our supervision at the Naval Proving Ground, Indian Head, Md., on Saturday, April 8, 1893.

The following tests were made:

The breech mechanism was disassembled for the inspection of the board, and reassembled again, and then disassembled and reassembled as rapidly as possible by the inventor, Mr. Sponsel. Time taken to disassemble, 32 seconds; time to reassemble 1 minute and 4 seconds.

Ten rounds were fired slowly to observe the general working of the breech mechanism, extractors, firing apparatus, etc.

Ten and then five rounds were fired as rapidly as possible as a test of rapidity of fire. The ten rounds were fired in 41¾ seconds and the five rounds in 12 seconds. These rounds were fired by Mr. Sponsel, who stated that he had had very little experience in firing the gun rapidly.

Five rounds were fired to test the safety devices.

Ten rounds were fired, using defective primers, to test firing pin. In the first and fifth of these rounds the primer failed to leak. In the second, third, fourth and sixth the primer leaked badly and the firing pin was blown back to the cocking position each time, remaining cocked. At the seventh round, primer leaked and the pin was blown nearly to cocking position, sticking there, and then worked sluggishly. On the eighth round, with a good primer, missfired twice, removed the cartridge, snapped firing pin twice, and then fired eighth, ninth, and tenth rounds with good primers without difficulty. The firing pin was removed and examined, the point of pin found to be considerably gummed. The leakage of gas was sufficient to thoroughly test the firing pin.

The chamber and bore of the gun were sponged out and the breech-mechanism replaced without cleaning, excepting the point of the firing pin, and then sixty consecutive rounds were fired as rapidly as possible. These sixty rounds were fired by employés of the proving ground, who had never handled the gun before, in 3 minutes and 36 seconds, there being delays of about ten seconds each at the forty-eighth and fifty-eighth rounds, on account of the cartridges sticking in the chamber, requiring several attempts to force them home. The breech mechanism was disassembled and thoroughly examined immediately after this firing and found to be cool and comparatively clean, what little dirt there was having come from the leaky primer test.

In regard to the points to be observed, as ordered in your letter, the board has to report as follows:

First. The strength and endurance of breech closure and its parts appear to be sufficient, although the board had no means of testing them with excessive pressures. The action of the breech mechanism and all its parts was efficient. No severe test was applied to the extractors, on account of the difficulty of making a 1-pounder case stick hard in the chamber, but the action appeared to be all that could be desired, and the two interchangeable extractors form an advantageous feature of the mechanism.

Second. The working parts were all easily manipulated, being assembled and disassembled quickly and without any special tools. An advantageous feature of this breech mechanism is that all its parts are contained in the breechblock and can, therefore, be be taken out or replaced at the same time. The motion of the crank, parallel to the face of the breech, appeared awkward in working the mechanism and interferes with the laniard used for firing, which should be arranged so as not to lead across the line of movement of the crank.

Third. The loading was as convenient and safe as in other guns of this caliber, and the locking device for holding up the breechblock, when closed, is efficient and safe. The possibility of jamming the hand of the loader in closing the breech is slight, being the same as in the Hotchkiss 1-pounder.

Fourth. The maximum rapidity of fire, as developed by an unpracticed person, was at the rate of twenty-five shots per minute, but this could be considerably increased with practice.

Fifth. Three men can serve this gun effectively.

Sixth. With the gun tested, it was possible to fire before the breech was completely closed, but not before it was so nearly locked as to be safe. This defect can, however, be removed without difficulty by a slight change in the firing pin.

Seventh. The heat due to rapid firing appeared to have no injurious effect upon the breech mechanism.

Eighth. An examination of the breechblock and its fittings were made after the 60-round rapid-fire test, and all parts were found in good condition and comparatively cool.

Very respectfully,

N. E. Mason,
Lieutenant, U. S. Navy.
P. R. Alger,
Professor, U. S. Navy.
John M. Poyer,
Ensign, U. S. Navy.

The Chief of Bureau of Ordnance,
Navy Department.

BUREAU-OF ORDNANCE, NAVY DEPARTMENT,
Washington City, April 7, 1893.

GENTLEMEN: The Navy Department has appointed you a board for the trial of the Sponsel rapid-fire gun.

The Bureau desires to test chiefly the efficiency and value of the breech mechanism.

To this end 100 rounds are to be fired. Of these, at least 60 should be fired consecutively and as rapidly as possible, and the remainder in such manner as the board may deem desirable to accomplish the purposes of the test.

The points observed are:

First. The strength, endurance and regular and proper working of the breech closure: (*a*) of the breechblock; (*b*) of the firing mechanism; (*c*) of the extractors.

Second. Ease of manipulation of all working parts.

Third. Convenience and safety of loading. Particular attention to be given to the action and security of the locking device for holding up the breechblock when closed; also to the possible danger of jamming the hand of the loader in closing the breech during rapid firing.

Fourth. Maximum rapidity of fire.

Fifth. Number of men required to serve the gun effectively.

Sixth. As to the possibility of firing before the breech is closed and securely locked.

Seventh. The effect of heat, due to rapid firing, upon the action of the breech mechanism or any of its parts.

Eighth. Particular examination should be made, after firing, of the condition of the breechblock and its fittings.

Ninth. The special tests with the 40 rounds above referred to should be made before the continuous firing of the 60 rounds.

Respectfully,

W. T. SAMPSON,
Chief of Bureau of Ordnance.

Lieut. N. E. MASON, U. S. Navy.
Prof. P. R. ALGER, U. S. Navy.
Ensign JOHN M. POYER, U. S. Navy.

REPORT

OF THE

CHIEF OF THE BUREAU OF CONSTRUCTION AND REPAIR.

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
Washington, D. C., October 2, 1893.

SIR: In obedience to the Department's instructions I have the honor to submit herewith a report of the work done under the cognizance of this Bureau for the fiscal year ending June 30, 1893, and also the estimates of appropriations required for the year ending June 30, 1895.

ESTIMATES.

The estimates for the expenditures of the Bureau as given in the statement marked A are in accordance with existing laws.

The estimate marked B is for the general repair of vessels at navy-yards and on foreign stations, purchase of stores, materials, machinery, tools of all kinds, preservation of material and stores, and for the proper performance of all work of repair and maintenance under the cognizance of this Bureau.

The estimates in the statement marked C are for the pay of such clerks and writers at the several navy-yards as are indispensable for the proper and systematic prosecution of the work.

The estimates marked D are for continuing the work on hulls and outfits of new vessels in course of construction.

The estimate marked E is to cover the cost of making good damage to Norwegian bark *Speranza* on account of collision with the U. S. S. *Monongahela.*

APPENDICES.

Appendix F is a list of the vessels of the Navy, divided into groups under heads of "Armored vessels," including single-turreted monitors, "Unarmored steel vessels," "Torpedo boats," "Iron steam vessels," "Wooden steam vessels," "Tugboats," and "Vessels unfit for sea service." Appendix G contains reports from naval constructors showing condition of work July 1, 1893, on vessels building or completing at navy-yards or under contract at private yards. Appendix H contains reports from naval constructors regarding improvements needed at navy-yards in the plants for shipbuilding or repair work.

The following vessels have been surveyed and repairs ordered during the fiscal year 1892-'93:

Vessel.	Place.	Date.
Atlanta	New York, N. Y	July 30, 1892
Chicago	do	Aug. 1, 1892
Ferry launch No. 157	Portsmouth, N. H	Aug. 16, 1892
Nina	New York, N. Y	Aug. 17, 1892
Charleston	Mare Island, Cal	Aug. 27, 1892
Ranger	do	Sept. 10, 1892
Baltimore	do	Sept. 13, 1892
Fern	Portsmouth, N. H	Sept. 13, 1892
San Francisco	Mare Island, Cal	Sept. 17, 1892
Miantonomoh	New York, N. Y	Sept. 26, 1892
Philadelphia	do	Oct. 5, 1892
Portsmouth	do	Aug. 27, 1892
Yorktown	Mare Island, Cal	Oct. 17, 1892
Enterprise	Boston, Mass	Oct. 31, 1892
Wyandotte	Norfolk, Va	Nov. 3, 1892
Ranger	Mare Island, Cal	Nov. 4, 1892
Mohican	do	Nov. 4, 1892
Ferry scow	New York, N. Y	Nov. 19, 1892
Michigan	Buffalo, N. Y	Dec. 5, 1892
Adams	Mare Island, Cal	Dec. 27, 1892
Steam launch No. 166	do	Dec. 27, 1892
St. Marys	New York, N. Y	Jan. 28, 1893
San Francisco	Norfolk, Va	Feb. 28, 1893
Charleston	do	Mar. 1, 1893
Baltimore	New York, N. Y	Mar. 2, 1893
Charleston	Norfolk, Va	Mar. 9, 1893
Atlanta	do	Mar. 18, 1893
Constellation	do	Mar. 23, 1893
Essex	do	Mar. 25, 1893
Alliance	Mare Island, Cal	April 3, 1893
Newark	New York, N. Y	April 20, 1893
Bennington	do	April 26, 1893
Portsmouth	Norfolk, Va	May 5, 1893
Thetis	Mare Island, Cal	May 5, 1893
Monongahela	New York, N. Y	May 21, 1893
Nantucket	do	May 23, 1893
Baltimore	do	May 24, 1893
Kearsarge	Portsmouth, N. H	May 29, 1893

REPAIRS.

The following vessels have been repaired at the different navy-yards during the year ending June 30, 1893:

Monongahela.
Independence.
Cushing.
Ranger.
Thetis.
Adams.
Concord.
Alliance.
Traffic.
Vermont.
San Francisco.
Essex.
Kearsarge.
Fern.
Enterprise.
Franklin.
Constellation.
Chicago.
Baltimore.
Mayflower.
St. Marys.
Narkeeta.
Newark.
Charleston.
Hartford.
Mohican.
Vesuvius.
Iroquois.
Dolphin.
Miantonomoh.
Fortune.
Philadelphia.
Wahneta.
Jamestown.
Speedwell.
Ajax.
Constitution.
Iwana.
Wabash.
Atlanta.
Wyandotte.
Camancho.
Boston.
Nantucket.
Yorktown.
Portsmouth.
Bennington.

VESSELS STRICKEN FROM NAVY REGISTER.

The following vessels have been sold and their names stricken from the Navy Register:

Vessel.	Type.	Displacement.	Date of sale.
		Tons.	
Mayflower	Tug	450	Sept. 23, 1892.
Palos	Gunboat	420	Oct. 12, 1892.

PROGRESS OF WORK ON VESSELS IN COURSE OF CONSTRUCTION.

Good progress has been made on vessels in course of construction during the past year, although there has been some delay due to the deferred deliveries of armor plates. This cause of delay, however, is being gradually eliminated by the armor contractors, and it is expected that they will soon be able to furnish armor promptly so as not to retard the other work of hull construction.

Appendix G gives reports in detail, showing condition of new constructions on July 1.

TRIAL TRIPS.

During the past year the following vessels have had their official trial trips, the results in all cases being satisfactory to the Government trial board, and demonstrating the ability of our shipbuilders to turn out the highest grade of work:

Vessel.	Type.	Trial displacement.	Trial I. H. P.	Trial speed in knots per hour.	Date of trial.
		Tons.			
Monterey	Low freeboard coast-defense vessel.	4,000	5,244	13.6	Jan. 5, 1893
Bancroft	Practice cruiser	832	1,213	14.37	Jan. 26, 1893
Detroit	Cruiser	2,068	5,227	18.71	Apr. 17, 1893
New York	Armored cruiser	8,480	17,401	21.0	May 22, 1893
Machias	Gunboat	1,067	1,700	15.46	June 10, 1893

The following vessels have been launched during the year and are now being pushed to final completion:

Name.	Type.	Designed displacement.	Designed H. P.	Required speed.	Date of launch.
		Tons.		*Knots.*	
Columbia	Protected cruiser	7,350	21,000	21	July 26, 1892
Marblehead	Cruiser	2,000	5,400	17	Aug. 11, 1892
Olympia	Protected cruiser	5,500	13,500	20	Nov. 5, 1892
Cincinnati	do	3,183	10,000	19	Nov. 10, 1892
Katahdin	Ram	2,183	4,800	17	Feb. 4, 1893
Indiana	Armored battleship.	10,200	9,000	15	Feb. 28, 1893
Massachusetts	do	10,200	9,000	15	June 10, 1893
Minneapolis	Protected cruiser	7,350	21,000	21	Aug. 12, 1893

Of the above vessels, the *Columbia* and *Marblehead* are preparing for their acceptance trials, and will soon be added to the effective fleet of the Navy.

The *Olympia* and *Cincinnati* will probably have their trials within the next year.

NEW VESSELS.

In accordance with the provisions of an act making appropriations for the naval service for the fiscal year ending June 30, 1894, plans have been prepared for three light-draft protected gunboats. Advertisement has been made for proposals for the construction of these vessels, and the bids will be opened at the Navy Department on October 17, 1893.

The following extracts from circular prepared for information of bidders give the principal characteristics of the two types of vessel designed under the terms of the above act of Congress:

GUNBOAT NO. 7.

Any design of this vessel submitted must be in sufficient detail, accompanied by such plans, specifications, and calculations as to enable the Department to readily determine its value and that it fulfills the herein-mentioned general requirements. The calculations to include complete calculations of weights, displacement, and range of stability under the conditions of normal load displacement, deep load displacement, and light displacement; such calculations as will determine the extent of injury above and below the water-tight deck which may be suffered while retaining satisfactory buoyancy and stability, and also such calculations as will determine the satisfactory strength of the whole structure. The vessel, when ready for sea, with 150 tons of coal on board, must have a metacentric height of at least 3 feet, and a mean draft of not more than 11 feet.

It is contemplated, in the Department's design, to drive the vessel by twin screws. The engines to be of the vertical quadruple-expansion type, two in number—one on each shaft. The low-pressure cylinders to be readily uncoupled from the engines for cruising at low speeds. The boilers are placed in two compartments and are six in number—two cylindrical return fire-tubular boilers in one compartment, and four water-tubular boilers in the other compartment.

Any alternate design of machinery submitted by the contractors must fulfill the general requirements contained in "Specifications to be followed by contractors for machinery," issued by the Bureau of Steam Engineering. Such design must be accompanied by specifications in sufficient detail to enable the strength of the principal parts, and the probable efficiency of the whole design, to be readily determined. Further: All designs must be accompanied by calculations showing in detail the whole weight and position of center of gravity of all machinery, the former not to exceed the weight assigned in the circular if it is proposed to adopt the Department's design of hull.

The following elements and qualities must be obtained and provided for in all designs:

(1) The speed developed by the vessel on trial, under conditions to be prescribed by the Navy Department, must not be less than an average of 14 knots an hour, maintained successfully for four consecutive hours, during which period the air pressure shall not exceed in the ash pits of the cylindrical return fire-tubular boilers a pressure of 1 inch of water, and in the ash pits of the tubulous boilers a pressure of 2 inches of water; and, for the speed developed and maintained above 14 knots an hour, the contractors shall receive a premium, over and above the contract price, at the rate of $20,000 per knot; and, if the vessel fails to develop and maintain, as aforesaid, said speed of 14 knots an hour, deductions on account of such failure shall be made from the contract price at the rate of $20,000 per knot; and, if under conditions prescribed, as aforesaid, the vessel shall fail to successfully develop and maintain for four consecutive hours an average speed of at least 13 knots per hour, she shall be rejected. The speed trials shall take place at a mean draft of 11 feet.

The hull is to be of steel, not sheathed, with double bottom and close water-tight subdivision at the water line; the water-tight subdivision to be so arranged that at least two skins must be pierced to admit water to the engine or fire rooms.

The arrangements of decks above water to provide ample free-board and berthing accommodations.

It is contemplated to fit two masts with light sail power. The boats must be stowed clear of the blast of the guns, but two lifeboats must be so carried as to be rapidly lowered under all conditions of weather.

There will be a water-tight deck placed near the water line. Below this deck are to be placed the propelling machinery, steering gear, magazines, shell rooms, and all that is ordinarily styled the "vitals of a war ship."

Protection of the hull against injury to the water-line region is to be afforded by means of coal protection and suitable water-tight subdivision.

The battery of the vessel is to be eight 4-inch R. F. B. L. R., four 6-pounder R. F. Hotchkiss, two 1-pounder R. F. Hotchkiss, and two Gatling guns.

The 4 inch guns are to be mounted as follows: Four in the open on spar deck, placed two forward and two aft; and four in sponsons on a covered gun deck, two on either broadside. The guns on the spar deck to be protected with shields attached to the gun carriages; those on the gun deck to be protected by sponson armor 2½ inches thick.

Protection is to be afforded the smaller guns by shields and extra side plating.

The supply of ammunition to be as follows:

	Total rounds.
4-inch R. F. B. L. R., 125 rounds each	1,000
6-pounder R. F. Hotchkiss, 275 rounds each	1,100
1-pounder R. F. Hotchkiss, 350 rounds each	700
Saluting ammunition for 6-pounder	300
Ammunition for Gatling guns (.45 caliber)	20,000
" Magazine rifles (.45 caliber)	60,000
" .22 caliber rifles	50,000
Blank and drill cartridges	2,000
Ammunition for .36 caliber revolvers	10,000

The torpedo outfit to consist of one torpedo tube placed at the bow, above the water line.

Provisions are to be carried for three months; small stores for one year; general stores to be carried in sufficient quantity for the service of the vessel as a cruiser.

Evaporating and distilling apparatus will be fitted for fresh-water supply. The allowance of water to be carried to be sufficient for fifteen days for officers and crew, including water for sanitary purposes; and, in addition, sufficient to supply the boilers with fresh water for one day's steaming at full power (about 11 tons).

It is contemplated to drive the vessel by twin screws. The engines to be of the vertical quadruple-expansion type, two in number, one on each shaft. The low-pressure cylinders to be readily uncoupled from the engines for cruising at low speeds.

The total coal capacity must not be less than 380 tons, of which at least 150 tons are to be carried at normal load displacement.

The electric-lighting plant should consist of two units, each unit having an engine, dynamo, and combination bedplate, and each dynamo having a rated output of 100 ampères at 80 volts.

The total weight of the whole electrical installation, including dynamos, engines, bedplates, all fittings, wirings, stores, and search lights, should not exceed 10 tons.

General particulars of preliminary design, prepared by Bureau of Construction and Repair.

Length on load water line, normal displacement	220 ft. 00 ins.
Maximum breadth (molded)	36 " 00 "
Mean draft at normal displacement	11 " 00 "
Drag	None.
Free-board at bow	17 ft. 11 "
Free-board at stern	16 " 2 "
Normal displacement	1,261 tons.
Coal carried at normal displacement	150 "

Complement of officers and men—

Officers	11
Crew	129
Marines	10
	150

Armament : As before detailed.

Protection afforded to guns.

		Inches
For 4-inch R. F. guns on gun deck	armored sponsons	$2\frac{1}{2}$
For 6-pounder guns on gun deck	do	1

Summary of estimated weights.

	Tons.
Hull and fittings	705
Sponson armor	12
Armament, including guns, mounts, ammunition, ammunition hoists, torpedo outfit	74
Main and auxiliary machinery	161
Fresh water for engineers' use	11
Equipment, outfit, stores, etc	148
Coal at normal displacement	150
Total weight, equal to normal displacement	1,261

Detailed weights of armament (estimated).

	Tons.
Eight 4-inch R. F. B. L. R. with mounts and four shields	32.32
Four 6-pounder R. F. Hotchkiss guns with cage, mounts, and shields	3.89
Two 1-pounder R. F. Hotchkiss guns with cage, mounts, and shields	.23
Two Gatling guns with rail mounts and field carriages, complete	.56
One torpedo tube and two auto-mobile torpedoes	1.42
Rifles and revolvers	.66
Permanent fittings for secondary battery	.71
Magazine fittings for stowage and service of ammunition	.67
Ordnance equipments	.41
Ordnance stores, including spare parts	.51
1,000 rounds ammunition for 4-inch R. F. guns	20.89
1,100 rounds ammunition for 6-pounder R. F. guns (including boxes)	5.72
700 rounds ammunition for 1-pounder R. F. guns (including boxes)	.67
20,000 rounds ammunition for Gatling, .45 caliber	1.00
300 rounds ammunition (saluting) for 6-pounder (including boxes)	.62
60,000 rounds ammunition for magazine rifles, .45 caliber	3.00
50,000 rounds ammunition for .22 caliber rifles	.14
2,000 rounds blank and drill cartridges	.08
10,000 rounds ammunition for .38 caliber revolvers	.30
Total	73.80

Detail weights of equipment, outfit, stores, etc. (estimated).

	Tons.
Anchors and chains, hawsers, and general equipment	20.8
Electric-lighting system, complete, including dynamos and search lights	10.0
Complete system for operating mechanical and electric telegraphs and indicators, call bells, and fire and water alarms	1.3

Detail weights of equipment, outfit, stores, etc. (*estimated*)—Continued.

	Tons.
Masts and spars, complete, with all fittings, spare spars, etc., but not including rigging	8.6
Sails and rigging (sails, awnings, standing and running rigging, and miscellaneous rigging)	7.7
Boats, including boat outfits	10.2
Galley and fittings	1.4
Officers, men, and effects	17.0
Furniture and mess outfits	8.8
Provisions, clothing, and small stores	32.8
Fresh water (in tanks and for sanitary purposes)	8.4
Navigators', medical, and marines' stores	1.4
Construction stores	10.2
Cooperage	.6
Blocks	1.0
Warrant officers' stores	5.5
Officers' mess stores	2.7
Total	148.4

List of boats.

30-foot steam cutter	1
30-foot sailing launch	1
28-foot cutters	2
29-foot whale boats	2
18-foot dinghy	1

GUNBOATS NOS. 8 AND 9.

These vessels will be specially designed for service, such as that in Chinese waters, and any design submitted must be in sufficient detail, accompanied by such plans, specifications, and calculations as will enable the Department to readily determine its value and that it fulfills the herein-mentioned general requirements. The calculations to include complete calculations of weights, displacement, and range of stability under conditions of normal load displacement, deep load displacement, and light displacement; such calculations as will determine the extent of injury above and below the water-tight deck which may be suffered while retaining satisfactory buoyance and stability, and also such calculations as will demonstrate the satisfactory strength of the whole structure. The vessel, when ready for sea, with 190 tons of coal on board, must have a metacentric height of at least 3 feet, and a mean draft of not more than 9 feet 3 inches.

It is contemplated, in the Department's design, to drive the vessel by twin screws. The engines to be of the vertical triple-expansion type, two in number, one on each shaft. The boilers are placed in two compartments and are six in number.

Any alternate design of machinery submitted by the contractors must fulfill the general requirements contained in the "Specifications to be followed by contractors for machinery," issued by the Bureau of Steam Engineering. Such design must be accompanied by specifications in sufficient detail to enable the strength of the principal parts and the probable efficiency of the whole design to be readily determined. Further, all designs must be accompanied by calculations showing in detail the whole weight and position of center of all machinery, the former not to exceed the weight assigned in the circular if it is proposed to adopt the Department's design of hull.

The following elements and qualities must be obtained and provided for in all designs:

(1) The speed to be maintained for four consecutive hours, under conditions to be prescribed by the Secretary of the Navy, must not be

less than an average of 13 knots an hour; and for every knot exhibited above that speed the contractors shall receive a premium, over and above the contract price, at the rate of $20,000, and for every knot that such vessel fails of reaching said guaranteed speed (13 knots) deductions on account of such failure shall be made from the contract price at the rate of $20,000 per knot. The speed trials shall take place at a mean draft of 8 feet 10 inches.

(2) The hull is to be of steel, not sheathed, with double bottom and close water-tight subdivision at the water line. The water-tight subdivision to be so arranged that at least two skins must be pierced to admit water to the engine or fire room.

The arrangements of decks above water to provide ample free-board and berthing accommodations.

It is contemplated to fit one military mast. The boats must be stowed clear of the blast of guns, but two lifeboats must be so carried as to be readily lowered under all conditions of weather.

There will be a water-tight deck placed near the water line; below this deck are to be placed the propelling machinery, steering gear, magazines, shell rooms, and all that is ordinarily styled the "vitals of a war ship."

(3) Protection of the hull against injury to the water-line region is to be afforded by means of coal protection and suitable water-tight subdivision.

(4) The battery of the vessel is to be eight 4-inch R. F. B. L. R., six 6-pounder R. F. Hotchkiss, two 1-pounder R. F. Hotchkiss, and two Gatling guns (with rail and field carriages).

The 4-inch guns are to be mounted as follows: Two on the forecastle and the remainder on the gun deck. Those in the open to be protected by shields, the others by sponson armor 2¼ and 1 inch thick.

Protection is to be afforded the smaller guns by shields.

The supply of ammunition to be as follows:

	Total rounds.
4-inch R. F. B. L. R., 100 rounds each	800
6-pounder, R. F. Hotchkiss, 250 rounds each	1,500
1-pounder, R. F. Hotchkiss, 350 rounds	700
Saluting ammunition for 6-pounders	300
Ammunition for—	
Gatlings (.45 caliber)	20,000
Magazine rifles (.45 caliber)	60,000
.22-caliber practice rifles	50,000
Revolvers (.38 caliber)	10,000
Blank and drill catridges	2,000

(5) There will be one search light mounted as directed.

(6) Provisions are to be carried for three months; small stores for one year.

Evaporating and distilling apparatus will be fitted for fresh-water supply. The allowance of fresh water to be carried to be sufficient for twenty days for officers and crew, including water for sanitary purposes, and, in addition, sufficient to supply one-half the boilers with fresh water.

(7) It is contemplated to drive the vessel by twin screws. The engines to be of the vertical triple-expansion type, two in number, one on each shaft.

Alternate machinery must fulfill the general requirements before laid down by the Bureau of Steam Engineering.

(8) The total coal capacity must not be less than 275 tons, of which

at least 100 tons are to be carried at normal-load draft of 8 feet 10 inches.

(9) The electric-lighting plant should consist of two units, each unit having an engine, dynamo, and combination bedplate, and each dynamo having a rated output of 100 ampères at 80 volts.

The total weight of the whole electric installation, including dynamos, engines, bedplates, all fittings, wirings, stores, and search light, should not exceed 10 tons.

General particulars of preliminary design prepared by Bureau of Construction and Repair.

Length on load water line, normal displacement	250 ft.	6 ins.	
Maximum breadth (molded)	40 "	0 "	
Breadth at normal water line	39 "	8 "	
Mean draft at normal displacement	8 "	10 "	
Drag	None.		
Free-board at bow	19 ft.	9 "	
Free-board at stern	11 "	2 "	
Normal displacement	1,313 tons.		
Coal carried at normal displacement	100 "		
Complement of officers and men—			
Officers	11		
Crew	129		
Marines	10		
			150

Protection afforded to guns.

		Inches.
For 4-inch R. F. guns on gun deck	armored sponsors	2½
For 1-pounder R. F. Hotchkiss guns on gun deck	do	1

Summary of weights (estimated.)

	Tons.
Hull and fittings	771
Sponson armor	10
Armament, including guns, mounts, and hoists	70
Equipment, outfit and stores	152
Coal at normal displacement	100
Main and auxiliary machinery	200
Fresh water for engineers' use	10
Total weight, equal to displacement at 8 feet 10 inches draft	1,313

Detail weights of armament (estimated).

	Tons.
Eight 4-inch R. F. B. L. R., with mount and shields	32.32
Six 6-pounder R. F. Hotchkiss guns, with cages, etc	5.83
Two 1-pounder R. F. Hotchkiss guns, with cages, etc	.23
Two Gatlings	.56
Rifles and revolvers	.67
Magazine fittings for stowage and service of ammunition	.71
Permanent fittings for secondary battery	.89
Ordnance equipment	.41
Ordnance stores and spare parts	.57
800 rounds ammunition for 4-inch guns	13.88
1,500 rounds ammunition for 6-pounder guns	7.83
700 rounds ammunition for 1-pounder guns	.67
300 rounds ammunition (for saluting) for 6-pounder	.63
20,000 rounds ammunition for Gatling, .45 caliber	1.00
60,000 rounds ammunition for magazine rifles, .45 caliber	3.00
50,000 rounds ammunition for .22 caliber practice rifles	.14
2,000 rounds blank and drill cartridges	.83
10,000 rounds ammunition for .38 caliber revolvers	.30
Total	70.47

Detailed weights of equipment, outfit, stores, etc. (estimated).

	Tons.
Anchors and chains, hawsers, and general equipment	23.4
Electric-lighting system, including dynamos and search light	10.0
Complete system for operating mechanical and electric telegraphs and indicators, call bells, and fire and water alarms	1.3
Masts and spars complete, with all fittings, tops, etc., but not including rigging	8.7
Sails and rigging (sails, awning, standing and running rigging, and miscellaneous rigging)	4.6
Boats, including boat outfits	10.2
Galley and fittings	1.5
Officers, men, and effects	17.0
Furniture and mess outfits	9.3
Provisions, clothing, and small stores	32.8
Construction stores	10.2
Fresh water (in tanks and for sanitary purposes)	11.5
Navigators', medical, and marines' stores	1.5
Cooperage	.5
Blocks	.6
Warrant officers' stores	5.5
Officers' mess stores	3.0
Total	151.6

List of boats.

33-foot steam cutter	1
32-foot sailing launch	1
28-foot cutters	2
29-foot whale boats	2
18-foot dinghy	1

IMPROVEMENT OF NAVY-YARD PLANTS.

The special attention of the Department is called to Appendix H, showing the necessity for certain improvements in the shipbuilding plants at the various navy-yards.

The Bureau fully concurs in the recommendations therein contained, and has addressed letters to the Chief of Bureau of Yards and Docks in reference to the necessity of providing suitable buildings for the proper housing of tools already on hand or about to be procured, and has requested that Bureau to submit estimates to cover the necessary expenditure.

Many of the tools and appliances asked for by the naval constructors in the above-noted reports are much needed and would add greatly to the efficiency of the respective yards both for building and repair work; but in view of the present financial condition of the Government the Bureau refrains from asking for special appropriations at this time.

EXPERIMENTAL TANK—PROGRESSIVE SPEED TRIALS.

The present Chief Constructor is in perfect harmony with his predecessor's recommendations of recent years in relation to the above subjects, and cannot too forcibly impress upon the Department the necessity of taking early and definite action in order that the Bureau may, in its future design work, have the benefit of the very valuable data to be obtained from ships already built and in commission.

The United States is now the only great maritime country which does not possess an experimental tank, the Russians having remedied during the past year their deficiency in this respect.

The valuable data to be obtained by experiment with models in a properly equipped tank would soon repay the original outlay necessitated by its installation, and the Bureau earnestly recommends this subject to the favorable consideration of the Department.

PROGRESS MADE DURING THE PAST TEN YEARS.

In concluding his first report, the Chief Constructor considers it not only a pleasure but a duty to make special mention of the magnificent work accomplished by his predecessor during the decade in which he so ably and skillfully administered the affairs of this Bureau.

At the beginning of the administration of the late Chief of the Bureau of Construction and Repair, the Navy consisted of a comparatively small number of obsolete wooden steam and sailing vessels, and half a dozen small iron gunboats. Since that time there have been added to the Navy 45 vessels, aggregating 173,000 tons displacement, and costing for hulls and machinery alone more than $52,000,000. These vessels embrace almost every variety of type of modern vessels of war, and the excellence of their design and construction has been the subject of most pronounced commendation by naval architects who stand at the head of their profession in the principal maritime countries of Europe.

The responsibility involved in the design and construction of such vessels, rendered even more difficult in its earlier stages by the comparatively undeveloped state of steel-making and shipbuilding in this country, was great indeed, and no words of praise from his successor can add to the professional renown of one who has accomplished so successfully the great task of designing and building a navy which will ever be a monument to the skill, fidelity, and zeal of the late Chief of the Bureau of Construction and Repair.

I have the honor to be, very respectfully,

PHILIP HICHBORN,
Chief Constructor, U. S. N., Chief of Bureau.

The SECRETARY OF THE NAVY.

ESTIMATES, APPROPRIATION CONSTRUCTION AND REPAIR, 1894-'95.

Estimates of appropriations required for the fiscal year ending June 30, 1895, by the Bureau of Construction and Repair, Navy Department.

Detailed objects of expenditures and explanations.	Estimated amount required for each detailed object.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for current fiscal year ended June 30, 1894.
A. *Salaries.*			
Chief clerk (appropriated Mar. 3, 1893)	$1,800.00		
One draftsman (appropriated Mar. 3, 1893)	1,800.00		
One assistant draftsman (appropriated Mar. 3, 1893)	1,600.00		
One assistant draftsman (appropriated Mar. 3, 1893)	1,400.00		
One clerk of class 4 (appropriated Mar. 3, 1893)	1,800.00		
One clerk of class 3 (appropriated Mar. 3, 1893)	1,600.00		
One clerk of class 2 (appropriated Mar. 3, 1893)	1,400.00		
One clerk of class 1 (appropriated Mar. 3, 1893)	1,200.00		
One assistant messenger (appropriated Mar. 3, 1893)	720.00		
One laborer (appropriated Mar. 3, 1893)	660.00		
		$13,980.00	$13,980.00
B. *Construction and repair of vessels.*			
For preservation and completion of vessels on the stocks and in ordinary; purchase of materials and stores of all kinds; steam steerers, pneumatic steerers, steam capstans, steam windlasses, and other steam auxiliaries; labor in navy-yards and on foreign stations; purchase of machinery and tools for use in shops; wear, tear, and repair of vessels afloat, general care, increase, and protection of the Navy in the line of construction and repair; incidental expenses, such as advertising, freight, foreign postage, telegrams, telephone service, photographing, books, professional magazines, plans, stationery, and instruments for drafting room. (Appropriated Mar. 3, 1893)		900,000.00	950,000.00
C. *Civil establishment.*			
At navy-yard, Portsmouth, N. H.:			
One clerk to naval constructor (appropriated)	1,400.00		
Two writers, at $1,017.25 each (appropriated)	2,034.50		
At navy-yard, Boston, Mass.:			
One clerk to naval constructor (appropriated)	1,400.00		
At navy-yard, Brooklyn, N. Y.:			
One clerk to naval constructor (appropriated)	1,400.00		
Three writers, at $1,017.25 each (appropriated)	3,051.75		
At navy-yard, League Island, Pa.:			
One clerk to naval constructor (appropriated)	1,400.00		
At navy-yard, Washington, D. C.:			
One clerk to naval constructor (appropriated)	1,400.00		
At navy-yard, Norfolk, Va.:			
One clerk to naval constructor (appropriated)	1,400.00		
Two writers, at $1,017.25 each (appropriated)	2,034.50		
At navy-yard, Pensacola, Fla.:			
One writer, at $1,017.25 (appropriated)	1,017.25		
At navy-yard, Mare Island, Cal.:			
One clerk to naval constructor (appropriated)	1,400.00		
Two writers, at $1,017.25 each (appropriated)	2,034.50		
		19,972.50	19,972.50
D. *Increase of the Navy—Construction and machinery.*			
On account of hulls and outfits of vessels and steam machinery of vessels heretofore and herein authorized		5,955,025.00	

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
Washington D. C., August 11, 1893.

SIR: We have the honor to submit herewith, in duplicate, joint estimates (inclosures No. 1 and No. 2) of the amounts required by the Bureaus of Construction and Repair and Steam Engineering, under appropriation "increase of the Navy, construction and machinery," for work on new vessels authorized by Congress, to June 30, 1895, as per statements in detail herewith (marked inclosures No. 3 and No. 4), viz:

Under Bureau of Construction and Repair:	
For fiscal year 1893-'94	$6,465,392
For fiscal year 1894-'95	3,758,473
Total	$1

Estimates of appropriations required for the fiscal year ending June 30, 1895, by the Bureau of Construction and Repair, Navy Department—Continued.

Detailed objects of expenditures and explanations.	Estimated amount required for each detailed object.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for current fiscal year ended June 30, 1894.
D. *Increase of the Navy—Construction and machinery*—C't'd.			
Bureau of Steam Engineering: For fiscal year 1893–'94 .... $2,903,308 For fiscal year 1894–'95 1,563,727			
Total $4,467,035			
Aggregate .... 14,690,900 Balance in Treasury July 1, 1893 .... 1,860,875 Appropriation, act March 3, 1893 .... 6,875,000 8,735,875			
Appropriation required for 1894–'95 5,955,025			
This amount, $5,955,025, is the estimated amount required to be appropriated for work on new vessels authorized by Congress, for "increase of the Navy, construction and machinery," for the fiscal year ending June 30, 1895. Very respectfully, PHILIP HICHBORN, *Chief Constructor U. S. N.,* *Chief of Bureau of Construction and Repair.* GEO. W. MELVILLE, *Engineer in Chief, U. S. N.,* *Chief of Bureau of Steam Engineering.* The SECRETARY OF THE NAVY.			
E. Deficiency bill.			
For damages sustained by the Norwegian bark Speranza, when in collision with the Monongahela, in entering the harbor of Funchal on Jan. 16, 1893, in accordance with the record of the court of inquiry convened at the navy-yard, New York, by order of the Department, dated June 17, 1893 (submitted)	....	$2,180.82	....

APPENDIX F.—*Table of*

ARMORED

Name.	Type.	Keel laid.	By whom and where built or building.	Condition or service.	Dimensions. Length on load water line.	Dimensions. Breadth.	Dimensions. Mean draft.	Displacement.	Maximum indicated horse power.
					Ft. In.	*Ft. In.*	*Ft. In.*	*Tons.*	
Puritan	Iron low free-board coast-defense monitor. Two steel barbette turrets.	1875	John Roach, Chester, Pa.	In course of completion at U. S. navy-yard, New York.	289 6	60 1½	18 0	6,060	3,700
Miantonomoh	Iron low free-board coast-defense monitor. Two compound armor turrets.	1874	....do	North Atlantic station.	259 6	55 10	14 6	3,990	1,426
Amphitrite	Iron low free-board coast-defense monitor. Two steel barbette turrets.	1874	Harlan & Hollingsworth, Wilmington, Del.	In course of completion at U. S. navy-yard, Norfolk, Va.	259 6	55 10	14 6	3,990	1,600
Monadnock	....do	1874	U. S. navy-yard, Mare Island, Cal.	In course of completion.	259 6	55 10	14 6	3,990	3,000
Terror	Iron low free-board coast-defense monitor. Two steel turrets.	1874	Wm. Cramp & Sons, Philadelphia, Pa.	In course of completion at U. S. navy-yard, New York.	259 6	55 10	14 6	3,990	1,600
Texas	Steel armored battle ship. Two steel turrets.	1889	U. S. navy-yard, Norfolk, Va.	Building	301 4	64 1	22 6	6,300	8,600
Maine	Steel armored cruiser. Two steel barbette turrets.	1888	U. S. navy-yard, Brooklyn, N. Y.	....do	318 0	57 0	21 6	6,648	[illegible]
Monterey	Steel low free-board coast defense. Two steel barbette turrets.	1889	Union Iron Works, San Francisco, Cal.	Pacific station.	256 0	59 0	*14 6	*4,000	*5,244
New York	Steel armored cruiser. Two steel barbette turrets.	1890	Wm. Cramp & Sons, Philadelphia, Pa.	In commission awaiting assignment.	380 6½	64 10	23 10⅝ (*)	*8,480	17,401 (*)
Katahdin	Steel harbor-defense ram.	1891	Bath Iron Works, Bath, Me.	Building	250 9	43 5	15 0	2,183	4,800
Massachusetts	Steel coast-line battle ship. 2 13″ barbette turrets. 4 8″ barbette turrets.	1891	Wm. Cramp & Sons, Philadelphia, Pa.	....do	348 0	69 3	24 0	10,200	9,000
Indiana	....do	1891	....do	....do	348 0	69 3	24 0	10,200	9,000
Oregon	....do	1891	Union Iron Works, San Francisco, Cal.	....do	348 0	69 3	24 0	10,200	9,000

* Acceptance trial data.

vessels of the U. S. Navy.

VESSELS.

Type of engine.	Speed in knots per hour.	Batteries.		Armor.			Cost of hull and machinery	Date of act authorizing building or completion.
		Main.	Secondary.	Sides.	Turrets.	Barbettes.		
				Ins.	*Inches.*	*Inches.*		
Twin screw horizontal compound.	12.4	4 12" B. L. R. 6 4" R. F. guns.	4 3-pdr. R.F.G. 4 37mm H. R. C. 4 Gatlings.	14	8	14	Appropriation to complete, $3,178,046.	Mar. 3, 1885; Aug. 3, 1886; Mar. 3, 1887.
Twin screw inclined compound.	10.5	4 10" B. L. R.	2 6-pdr. R.F.G. 2 3-pdr. R.F.G. 1 1-pdr. R.F.G.	7	11½	....		Do.
...do	12	4 10" B. L. R. 2 4" R. F. guns.	2 6-pdr. R. F .. 2 3-pdr. R. F. 2 37mm H. R. C.	9	7½	11½		Do.
Twin screw horizontal triple expansion.	14.5	4 10" B. L. R. 2 4" R. F. guns.	2 6-pdr. R. F .. 2 3-pdr. R. F. 2 37mm H. R. C.	9	7½	11½		Do.
Twin screw inclined compound.	12	4 10" B. L. R.	2 6-pdr. R. F .. 2 3-pdr. R. F. 2 37mm H. R.C. 2 Gatlings.	7	11½	....		Do.
Twin screw vertical triple expansion.	17	2 12" B. L. R. 6 6" B. L. R.	12 6-pdr. R. F.. 6 1-pdr. R. F. 4 37mm H. R. C. 2 Gatlings.	12	12	....	*$2,500,000	Aug. 3, 1886.
...do	17	4 10" B. L. R. 6 6" B L. R.	8 6-pdr. R. F .. 8 1-pdr. R. F. 4 Gatlings.	12	8	12	*2,500,000	Mar. 3, 1887.
...do	†13.6	2 12" B. L. R. 2 10" B. L. R.	6 6-pdr. R. F .. 4 1-pdr. R. F. 2 Gatlings.	13	For'd 8" . Aft 7½".	For'd 14" Aft 11½".	‡1,628,950	Mar. 3, 1887.
...do	†21	6 8" B. L. R. 12 4" R. F. guns.	8 6-pdr. R. F .. 4 1-pdr. R. F. 4 Gatlings.	4	5½	10	‡2,985,000	Sept. 7, 1888.
...do	17	....	4 6-pdr. R. F ..	6	....	....	‡930,000	Mar. 2, 1889.
...do	15	4 13" B. L. R. 8 8" B. L. R. 4 6" B. L. R.	20 6 pdr. R. F . 6 1-pdr. R. F. 4 Gatlings.	18	15 6 6	17 8 6	‡3,020,000	June 30, 1890.
...do	15	4 13" B. L. R. 8 8" B. L. R. 4 6" B. L. R.	20 6-pdr. R. F . 6 1-pdr. R. F. 4 Gatlings.	18	...do	...do	‡3,020,000	Do.
...do	15	4 13" B. L. R. 8 8" B. L. R. 4 6" B. L. R.	20 6-pdr. R. F . 6 1-pdr. R. F. 4 Gatlings.	18	...do	...do	‡3,180,000	Do.

* Limit of cost. † Acceptance trial speed. ‡ Contract price.

APPENDIX F.—*Table of vessels*

ARMORED

Name.	Type.	Keel laid.	By whom and where built or building.	Condition or service.	Dimensions.			Displacement.	Maximum indicated horse power.
					Length on load water line.	Breadth.	Mean draft.		
					Ft. In.	*Ft. In.*	*Ft. In.*	*Tons.*	
Iowa	Steel sea-going battle ship. 2 12″ barbette turrets. 4 8″ barbette turrets.	1893	Wm. Cramp & Sons, Philadelphia, Pa.	Building	360 0	72 2½	24 0	11, 296	11, 000
Brooklyn	Steel armored cruiser. 4 8″ barbette turrets.	1893	....do	....do	400 6	64 0	24 0	9, 153	16, 000

APPENDIX F.—*Table of vessels*

SINGLE-TURRET

Name.	Type.	Keel laid.	By whom and where built.	Condition.	Dimensions.			Displacement.	Indicated horse power.
					Length between perpendiculars.	Breadth.	Mean draft.		
					Feet.	*Ft. In.*	*Ft. In.*	*Tons.*	
Ajax	Low free board single-turret monitor.	1862	Snowden & Mason, Pittsburg, Pa.	In ordinary, near Richmond.	225	43 8	13 6	2, 100	340
Comanche	....do	1862	Donahue, Ryan & Secor, Jersey City, N. J.	In ordinary, Mare Island, Cal.	200	46 0	11 6	1, 875	340
Canonicus	....do	1862	Harrison Loring, Boston, Mass.	In ordinary, near Richmond.	225	43 8	13 6	2, 100	340
Catskill	....do	1862	John Ericsson, Brooklyn, N. Y.	....do	200	46 0	11 6	1, 875	340
Jason	....do	1862	John Ericsson, Chester, Pa.	In ordinary, League Island, Pa.	200	46 0	11 6	1, 875	340
Lehigh	....do	1862	....do	In ordinary, near Richmond.	200	46 0	11 6	1, 875	340
Mahopac	....do	1862	Z. and F. Secor, Jersey City, N. J.	....do	225	43 8	13 6	2, 100	340
Manhattan	....do	1862	Perine, Secor & Co., Jersey City, N. J.	....do	225	43 8	13 6	2, 100	340
Montauk	....do	1862	John Ericsson, Brooklyn, N. Y.	In ordinary, League Island, Pa.	200	46 0	11, 6	1, 875	340
Nahant	....do	1862	Harrison Loring, Boston, Mass.	....do	200	46 0	11 6	1, 875	340
Nantucket	....do	1862	Atlantic Works, Boston, Mass.	Southport, N. C., for use of Naval Reserves.	200	46 0	11 6	1, 875	340
Passaic	....do	1862	John Ericsson, Brooklyn, N. Y.	Boston, Mass. For use of Naval Reserves.	200	46 0	11 6	1, 875	340
Wyandotte	....do	1862	Miles Greenwood, Cincinnati, Ohio.	In ordinary, near Richmond.	225	43 8	13 6	2, 100	340

of the U. S. Navy—Continued.

VESSELS—Continued.

Type of engine.	Speed in knots per hour.	Batteries.		Armor.			Cost of hull and machinery.	Date of act authorizing building or completion.
		Main.	Secondary.	Sides.	Turrets.	Barbettes.		
				Ins.	*Inches.*	*Inches.*		
...do	16	4 12" B. L. R. 8 8" B. L. R. 6 4" R. F. G.	20 6-pdr. R. F. 6 1-pdr. R. F. 4 Gatlings.	14 3	15 5½	15 8 and 6	*$3,010,000	July 19, 1892.
...do	20	8 8" B. L. R. 12 5" R. F. G.	12 6-pdr. R. F. G. 4 1-pdr. R. F. 4 Gatlings.		5½	8 and 4	*2,986,000	Do.

of the U. S. Navy—Continued.

MONITORS (IRON).

Type of engine.	Speed in knots.	Batteries.		Armor.		Cost of hull and machinery.	Date of act authorizing building.
		Main.	Secondary.	Sides.	Turret.		
				Ins.	*Ins.*		
Single-screw grasshopper.	5 to 6	2 XV" S. B. ...	None	5	10	$626,582.24	Apr. 17, 1862.
......do	5 to 6	None	....do	5	11	613,164.98	Do.
......do	6	2 XV" S. B. ...	2 12-pdr. H.	5	10	622,963.22	Do.
......do	6	....do	None	5	11	427,766.78	Do.
......do	5 to 6	....do	....do	5	11	422,766.73	Do.
......do	5 to 6	....do	....do	5	11	422,726.28	Do.
......do	6	....do	....do	5	10	635,374.55	Do.
......do	6	....do	....do	5	10	628,879.27	Do.
......do	5 to 6	....do	....do	5	11	423,027.49	Do.
......do	5 to 6	....do	....do	5	11	413,515.14	Do.
......do	5 to 7	....do	....do	5	11	408,091.37	Do.
......do	5 to 6	....do	1 12-pdr. H.	5	11	423,171.69	Do.
......do	6	....do	....do	5	10	633,327.84	Do.

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* Contract price.

APPENDIX F.—*Table of vessels*

UNARMORED

Name.	Type.	Keel laid.	By whom and where built or building.	Condition or service.	Dimensions. Length on load water line.	Dimensions. Extreme breadth.	Dimensions. Mean draft.	Displacement.	Maximum indicated horse power.
					Ft. In.	*Ft. In.*	*Ft. In.*	*Tons.*	
Chicago	Protected cruiser.	1883	John Roach & Sons, Chester, Pa.	Flagship European station.	325 0	48 2	19 0	4,500	5,084
Boston	...do	1883	...do	Pacific station.	270 3	42 0	17 0	3,189	4,030
Atlanta	...do	1883	...do	Out of commission; navy-yard, Norfolk, Va.	270 3	42 0	17 0	3,189	4,030
Dolphin	Dispatch boat.	1883	...do	Special service.	240	32 0	14 3	1,485	2,240
Newark	Protected cruiser.	1887	Wm. Cramp & Sons, Philadelphia, Pa.	Flagship, South Atlantic station.	310 0	49 2	18 9	4,083	8,869
Charleston	...do	1887	Union Iron Works, San Francisco, Cal.	En route Pacific station.	312 0	46 0	19 7	4,040	6,666
Baltimore	...do	1887	Wm. Cramp & Sons, Philadelphia, Pa.	En route as flagship Asiatic station.	327 6	48 6	20 6	4,600	10,064
San Francisco	...do	1888	Union Iron Works, San Francisco, Cal.	Flagship, North Atlantic station.	310 0	49 2	18 9	4,083	10,400
Philadelphia	...do	1888	Wm. Camp & Sons, Philadelphia, Pa.	Flagship, Pacific station.	327 6	48 6	19 2½	4,324	8,815
Olympia	...do	1890	Union Iron Works, San Francisco, Cal.	Building	340 0	53 0	21 6	5,500	13,500
Cincinnati	...do	1890	U. S. navy-yard, Brooklyn, N. Y.	...do	300 0	42 0	18 0	3,183	10,000
Raleigh	...do	1889	U. S. navy-yard, Norfolk, Va.	...do	300 0	42 0	18 0	3,183	10,000
Montgomery	Cruiser	1890	Columbian Iron Works, Baltimore, Md.	Preparing for trial trip.	257 0	37 0	14 6	2,000	5,400
Detroit	...do	1890	...do	In commission awaiting assignment.	257 0	37 0	*14 9	*2,088	*5,227
Marblehead	...do	1890	City Point Works, Boston, Mass.	Preparing for trial trip.	257 0	37 0	14 6	2,000	5,400
Columbia	Protected cruiser.	1890	Wm. Cramp & Sons, Philadelphia, Pa.	Preparing for trial trip.	412 0	58 0	22 6½	7,350	21,000
Minneapolis	...do		...do	Building	412 0	58 0	22 6½	7,350	21,000

* Acceptance trial data.

of the U. S. Navy—Continued.

STEEL VESSELS.

Type of engine.	Speed in knots per hour.	Batteries.		Cost of hull and machinery.	Date of act authorizing the building.	Contract signed.	Time to complete from date of contract.
		Main.	Secondary.				
							Mos.
Twin screw compound overhead beam.	15.33	4 8" B. L. R. 8 6" B. L. R. 2 5" B. L. R.	9 6-pdr. R. F. 4 1-pdr. R. F. 2 37mm H. R. C. 2 Gatlings.	*$889,000	Mar. 3, 1883	July 26, 1883	......
Single screw horizontal compound.	15.60	6 6" B. L. R. 2 8" B. L. R.	2 6-pdr. R. F. 2 3-pdr. R. F. 2 1-pdr. R. F. 2 47mm H. R. C. 2 37mm H. R. C. 2 Gatlings.	*619,000	....do	....do	......
....do	15.60	6 6" B. L. R. 2 8" B. L. R.	2 6-pdr. R. F. 2 3-pdr. R. F. 2 1-pdr. R. F. 2 47mm H. R. C. 2 37mm H. R. C. 2 Gatlings.	*617,000	....do	....do	......
Single screw vertical compound.	15.50	2 4" R. F. guns	2 6-pdr. R. F. 2 47mm H. R. C. 2 Gatlings.	*315,000	....do	....do	......
Twin screw horizontal triple expansion.	19.00	12 6" B. L. R.	4 6-pdr. R. F. 4 3-pdr. R. F. 2 1-pdr. R. F. 3 37mm H. R. C. 4 Gatlings.	*1,248,000	Mar. 3, 1885	Oct. 27, 1887	24
Twin screw horizontal compound.	18.20	2 8" B. L. R. 6 6" B. L. R.	4 6-pdr. R. F. 2 3-pdr. R. F. 2 1-pdr. R. F. 4 37mm H. R. C. 2 Gatlings.	*1,017,000	....do	Dec. 28, 1886	18
Twin screw horizontal triple expansion.	19.575	4 8" B. L. R. 6 6" B. L. R.	4 6-pdr. R. F. 2 3-pdr. R. F. 2 1-pdr. R. F. 4 37mm H. R. C. 2 Gatlings.	*1,325,000	Aug. 3, 1886	Dec. 17, 1886	18
....do	20.17	12 6" B. L. R.	4 6-pdr. R. F. 4 3-pdr. R. F. 2 1-pdr. R. F. 3 37mm H. R. C. 4 Gatlings.	*1,428,000	Mar. 3, 1887	Oct. 26, 1887	24
....do	19.678	12 6" B. L. R.	4 6-pdr. R. F. 4 3-pdr. R. F. 2 1-pdr. R. F. 3 37mm H. R. C. 4 Gatlings.	*1,325,000	....do	Oct. 27, 1887	24
Twin screw vertical triple expansion.	20.00	10 5" R. F. guns 4 8" B. L. R.	14 6-pdr. R. F. 6 1-pdr. R. F. 4 Gatlings.	*1,796,000	Sept. 7, 1888	July 10, 1890	April 1, 1893
....do	19.00	10 5" R. F. guns 1 6" R. F. gun.	8 6-pdr. R. F. 4 1-pdr. R. F. 2 Gatlings.	†1,100,000	....do	....	......
....do	19.00	10 5" R. F. guns 1 6" R. F. gun.	8 6-pdr. R. F. 4 1-pdr. R. F. 2 Gatlings.	†1,100,000	....do	....	......
....do	17.00	8 5" R. F. guns 2 6" R. F. guns	6 6-pdr. R. F. 2 1-pdr. R. F. 2 Gatlings.	*612,500	....do	Nov. 2, 1889	30
....do	‡18.71	8 5" R. F. guns 2 6" R. F. guns	6 6-pdr. R. F. 2 1-pdr. R. F. 2 Gatlings.	*612,500	....do	....do	30
....do	17.00	8 5" R. F. guns 2 6" R. F. guns	6 6-pdr. R. F. 2 1-pdr. R. F. 2 Gatlings.	*674,000	....do	Nov. 11, 1889	30
Triple screw vertical triple expansion.	21	1 8" B. L. R. 2 6" R. F. guns 8 4" R. F. guns	12 6-pdr. R. F. 4 1-pdr. R. F. 4 Gatlings.	*$2,725,000	June 30, 1890	Nov. 19, 1890	30
....do	21	1 8" B. L. R. 2 6" R. F. guns 8 4" R. F. guns	12 6-pdr. R. F. 4 1-pdr. R. F. 4 Gatlings.	*2,690,000	Mar. 2, 1891	Aug. 31, 1891	24

* Contract price † Limit of cost. ‡ Acceptance trial speed.

APPENDIX F.—*Table of vessels*

UNARMORED

Name.	Type.	Keel laid.	By whom and where built or building.	Condition or service.	Dimensions.			Displacement.	Maximum indicated horse power.
					Length on load water line.	Extreme breadth.	Mean draft.		
GUNBOATS.					*Ft. In.*	*Ft. In.*	*Ft. In.*	*Tons.*	
Petrel	Gunboat	1887	Columbian Iron Works, Baltimore, Md.	Asiatic station.	176 3	31 0	11 7	890	1,513
Yorktown	...do	1887	Wm. Cramp & Sons, Philadelphia, Pa.	Pacific station.	230 0	36 0	14 0	1,700	3,660
Concord	...do	1888	N. F. Palmer & Co., Chester Pa.	En route: Asiatic station.	230 0	36 0	14 0	1,700	3,405
Bennington	...do	1888	...do	European station.	230 0	36 0	14 0	1,700	3,436
Machias	...do	1891	Bath Iron Works, Bath, Me.	North Atlantic station.	190 0	32 0	*12 0	*1,067	*1,700
Castine	...do	1891	...do	Preliminary trials completed.	190 0	32 0	*12 0	*1,067	*2,186
Gunboat No. 7	Light draft gunboat.		Contract not yet awarded.		220 0	36 0	11 0	1,261	1,750
Gunboat No. 8	...do		...do		250 6	40 0	8 10	1,313	1,600
Gunboat No. 9	...do		...do		250 6	40 0	8 10	1,313	1,600
SPECIAL CLASS.									
Vesuvius	Dynamite cruiser.	1887	Wm. Cramp & Sons, Philadelphia, Pa.	North Atlantic station.	251 9	26 5	10 7½	930	3,794.86
Bancroft	For naval cadets.	1891	Moore & Sons, Elizabethport, N. J.	Naval Academy.	187 6	32 0	*11 6	*832	*1,213
Dynamite cruiser No. 2.				Subject to orders from the Department.					
Torpedo cruiser				...do					
TORPEDO BOATS.									
Stilletto	Wood torpedo boat.		Purchased from Herreschoff M'f'g Co.	Torpedo practice, Newport, R. I.	88 6	11 0	3 0	31	359
Cushing	Steel torpedo boat.	1889	Herreschoff M'f'g Co., Bristol. R. I.	Special service	138 9	14 10	5 3	116	1,720
Ericsson	...do	1892	Iowa Iron Works, Dubuque, Iowa.	Building.	150 0	15 6	4 9	120	1,800

* Acceptance trial data.

of the U. S. Navy—Continued.

STEEL VESSELS—Continued.

Type of engine.	Speed in knots per hour.	Batteries.		Cost of hull and machinery.	Date of act authorizing the building.	Contract signed.	Time to complete from date of contract.
		Main.	Secondary.				*Mos.*
Single screw horizontal compound.	11.53	4 6" B. L. R..	2 3-pdr. R. F.. 1 1-pdr. R. F. 2 37mm H. R. C. 2 Gatlings.	*$247,000	Mar. 3, 1885	Dec. 22, 1886	12
Twin screw horizontal triple expansion.	16.65	6 6" B. L. R..	2 6-pdr. R. F.. 2 3-pdr. R. F. 1 1-pdr. R. F. 2 37mm H. R. C. 2 Gatlings.	*455,000	Mar. 3, 1885	Jan. 31, 1887	12
....do............	16.8	6 6" B. L. R..	2 6-pdr. R. F.. 2 3-pdr. R. F. 1 1-pdr. R. F. 2 37mm H. R. C. 2 Gatlings.	*490,000	Mar. 3, 1887	Nov. 15, 1887	18
....do............	17.5	6 6" B. L. R..	2 6 pdr. R. F.. 2 3-pdr. R. F. 1 1-pdr. R. F. 2 37mm H. R. C. 2 Gatlings.	*490,000	....do......	....do......	18
Twin screw vertical triple expansion.	†15.46	8 4" R.F.guns	4 6-pdr. R. F .. 2 1-pdr. R. F. 2 Gatlings.	*318,000	Mar. 2, 1889	Apr. 12, 1890	24
....do............	†16.00	8 4" R.F.guns	4 6-pdr.R.F.G. 2 1-pdr.R.F.G. 2 Gatlings.	*318,000	....do......	....do......	24
Twin screw vertical quadruple expansion.	14	8 4" R.F.guns 1 torpedo tube	4 6-pdr.R.F.G. 2 1-pdr.R.F.G. 2 Gatlings.	....	Mar. 3, 1893	....	......
Twin screw vertical triple expansion.	13	8 4" R.F.guns	....do........	....	....do......	....	......
....do............	13	....do........	....do........	....	....do......	....	......
....do............	22.5	3 dynamite guns, 15" cal.	3 3-pdr. R. F ..	*350,000	Aug. 3, 1886	Feb. 11, 1887	12
....do............	†14.37	4 4" R.F.guns	2 6-pdr. R. F .. 2 3-pdr. R. F. 1 1-pdr. R. F. 1 37mm H. R. C. 1 Gatling.	*250,000	Sept. 7, 1888	July 18, 1890	24
....	......	....	....	....	....	....	......
....	......	....	....	....	....	....	......
Single screw vertical.	18.22	None........	None........	‡25,000	....	....	......
Twin screw vertical quadruple expansion.	22.5	3 torpedo tubes.	3 1-pdr. R. F ...	*82,750	Mar. 3, 1887	Mar. 1, 1888	15
....do............	24.00	3 18" Whitehead torpedo tubes.	4 1-pdr. R. F ..	*113,500	June 30, 1890	....	12

*Contract price. †Acceptance trial speeds. ‡Limit of cost.

APPENDIX F.—*Tables of vessels*

IRON AND WOODEN

Name.	Built.			Condition of service.	Rig.
	When.	Where.	By whom.		
IRON.					
Ranger	1873–1876	Wilmington, Del.	Harlan & Hollingsworth.	Pacific station	Bark
Alert	1873–1875	Chester, Pa	John Roach	Asiatic station	do
Monocacy	1863	Baltimore, Md	A. & W. Denmead & Son.	do	Schooner
Michigan	1844	Erie, Pa	United States	Special service Northwestern lakes.	Barkentine
Pinta	1865	Chester, Pa	Reany, Son & Archbold.	Special service	Schooner
Alarm	1874	New York, N.Y.	United States	In ordinary, at navy-yard, New York.	
WOODEN.					
Lancaster	1858	Philadelphia, Pa.	United States	Flagship, Asiatic station.	Ship
Pensacola	1858–1862	Pensacola, Fla	do	In ordinary, at navy yard, Mare Island.	do
Hartford*	1858	Boston, Mass	do	do	do
Richmond	1858	Norfolk, Va	do	Training squadron	do
Omaha	1867–1869	Philadelphia, Pa	do	In ordinary, at navy-yard, Mare Island.	Bark
Swatara	1872	New York, N.Y.	do	do	Ship
Marion	1871–1875	Kittery	do	Asiatic station	Bark
Mohican	1872–1883	Mare Island	do	Pacific station	do
Iroquois	1858	New York	do	In ordinary, at navy-yard, Mare Island.	Ship
Kearsarge	1861	Kittery	do	North Atlantic station.	Bark
Adams	1874–1876	Boston	United States and Donald McKay.	Pacific station	do
Alliance	1873–1876	Norfolk	United States	do	do
Essex	1874–1876	Kittery and Boston.	United States and Donald McKay.	Fitting out at navy-yard, Norfolk, Va.	do
Enterprise	1873–1876	Kittery	John W. Griffith and United States.	Nautical school ship, Boston, Mass.	do
Nipsic	1873–1879	Washington	United States	Naval station, Puget Sound.	do
Yantic	1864	Philadelphia, Pa	United States	South Atlantic station.	Bark
Thetis		Dundee, Scotland	Alex. Stevens & Sons.	Pacific station	do

* To be refitted with new machinery and modern battery.

of the U. S. Navy—Continued.

STEAM VESSELS.

Dimensions.			Displacement.	Indicated horse power.	Speed in knots per hour.	Batteries.		Coal capacity.	Complement.	
Length between perpendiculars.	Breadth.	Mean draft.				Main.	Secondary.		Officers.	Men.
Ft. In	*Ft. In*	*Ft. In*	*Tons.*					*Tons.*		
175 0	32 0	12 9	1,020	365	10	2 IX" S. B. 1 VIII" M. L. R. 1 60-pdr. B. L. R.	1 3" B. L. H. 2 37mm H. R. C. 1 Gatling.	*126	21	127
175 0	32 0	12 9	1,020	365	10	2 IX" S. B. 1 XI" S. B. 1 60-pdr. B. L. R.	1 3" B. L. H. 1 12-pdr. S. B. howtz. 1 Gatling.	*133	21	127
255 0	35 0	9 0	1,370	850	11.2	4 VIII" S. B. 2 60-pdr. B. L. R.	1 3" B. L. H. 1 12-pdr. S. B. howtz. 6 37mm H. R. C. 2 47mm H. R. C. 1 Gatling	†224	12	114
163 3	27 1½	9 0	685	305	10.5	4 30-pdr. B. L. R.	3 3" B. L. H. 2 Gatlings.	*135	.....	.....
137 0	26 0	10 0	550	190	8.5	4 12-pdr. S. B. howtz.	1 Gatling	*111	8	37
158 6	28 0	10 6	800	600	10	.....	.....	*405	.....	.....
235 8	46 0	19 2	3,250	733	9.6	10 8" M. L. R.	1 3" B. L. H. 2 6-pdr. R. F. 2 1-pdr. R. F. 4 37mm H. R. C. 1 Gatling.	†288	.....	.....
230 8	44 6	18 7	3,000	680	9	Battery landed	Battery landed	*285	.....	.....
225 0	44 0	18 6	.....	.....	.....	.....	.....	*240	32	285
225 0	42 6	17 4½	2,700	692	9.5	12 IX" S. B. 1 8" M. L. R. 1 60-pdr. B. L. R.	2 20-pdr. B. L. R. 1 3" B. L. R. 2 37mm H. R. C. 1 Gatling.	†265	29	321
250 6	38 0	16 6	2,400	953	11.3	.....	Battery landed	.....	.....	.....
216 0	37 0	16 6	1,900	680	10.1	.....	do	.....	.....	.....
216 0	37 0	16 6	1,900	753	11.25	1 8" M. L. R. 6 IX" S. B. 1 60-pdr. B. L. R.	2 20-pdr. B. L. R. 1 3" B. L. H. 2 37mm H. R. C. 1 Gatling.	*135	18	176
216 0	37 0	16 6	1,900	613	10.65	8 IX" S. B. 1 8" M. L. R. 1 60-pdr. B. L. R.	2 20-pdr. B. L. R. 1 3" B. L. H. 1 12-pdr. S. B. howtz. 2 37mm H. R. C. 1 Gatling.	*162	21	193
198 10	33 10	15 3	1,575	1,202	10.7	Battery landed	Battery landed	*128	.....	.....
198 6	33 0	15 9	1,550	813	11.1	4 IX" S. B. 2 8" M. L. R. 1 60-pdr. B. L. R.	1 3" B. L. H. 1 Gatling.	*165	21	191
185 0	35 0	14 3	1,375	550	9.8	4 IX" S. B. 1 8" M. L. R. 1 60-pdr. M. L. R.	1 3" B. L. H. 2 37mm H. R. C. 1 Gatling.	*150	20	160
185 0	35 0	14 3	1,375	668	9.98	4 IX" S. B. 1 8" M. L. R. 1 60 pdr. M. L. R.	1 3" B. L. H. 1 Gatling.	*150	18	160
185 0	35 0	14 3	1,375	505	10.4	8 4" R. F. G.	2 6-pdr. R. F. G. 2 1-pdr. R. F. G.	†130	15	170
185 0	35 0	14 3	1,375	790	11.4	4 IX" S. B. 1 8" M. L. R. 1 60-pdr. B. L. R.	2 3" B. L. H. 1 37mm H. R. C. 1 Gatling.	*130	.....	.....
185 0	35 0	14 3	1,375	839	10.7	.....	Battery landed	†132	.....	.....
180 0	30 0	12 2	900	225	8.30	2 IX" S. B. 1 8" M. L. R. 1 60-pdr. B. L. R.	1 12-pdr. S. B. howtz. 1 Gatling. 1 3" B. L. H.	*117	20	134
166 0	30 3	18 0	1,250	490	7.55	.....	1 53mm H. R. C.	300	10	98

* Anthracite. † Bituminous.

WOODEN SAIL

Name.	Built.			Condition of service.	Rig.
	When.	Where.	By whom.		
Constellation	1854	Gosport	United States	Special service	Ship
Monongahela	1862	Philadelphia	do	Training squadron	Bark
Portsmouth	1843	Kittery	do	do	Ship
Jamestown	1845	Gosport	do	Hospital ship	do
Saratoga	1842	Kittery	do	Nautical school ship Philadelphia, Pa.	do
St. Mary's	1844	Washington	do	Nautical school ship, New York.	do

STEEL, IRON AND

Name.	Built.			Material.
	When.	Where.	By whom.	
Catalpa	1864		Purchased	Wood
Fortune	1865	Boston	John Tetlow	Iron
Leyden	1866	do	James Tetlow	do
Ivy	1863		Purchased	Wood
Nellie	1887	Navy-yard, Mare Island, Cal.	United States	do
Nina	1865	Chester	Reany, Son & Archbold.	Iron
Rocket	1863		Purchased	Wood
Standish	1865	Boston	James Tetlow	Iron
Triton	1888	Camden, N. J.	Jno. H. Dialogue	Steel
Iwana	1891	Boston	City Point Iron Wks.	do
Wahneta	1891	do	do	do
Narkeeta	1891	do	do	do

of the U. S. Navy—Continued.

ING VESSELS.

Dimensions.			Displacement.	Indicated horse power.	Speed in knots per hour.	Batteries.		Coal capacity.	Complement.	
Length between perpendiculars.	Breadth.	Mean draft.				Main.	Secondary.		Officers.	Men.
Ft. In	*Ft. In*	*Ft. In*	*Tons.*					*Tons.*		
176 0	42 0	20 0	1,186	......	......	8 VIII" S. B........	2 20-pdr. B. L. R.....	......	15	203
223 0	38 0	16 6	2,100	......	......	6 VIII" S. B........	1 3" B. L. H .... 1 6-pdr. R. F. G ..... 4 37mm H. R. C.	......	 21	 380
153 0	38 3	16 6	1,125	......	......	11 VIII" S. B....... 1 60-pdr. B. L. R	2 20-pdr. B. L. R..... 1 3" B L. H. 1 Gatling.	......	15	210
163 6	36 0	16 0	1,150	......	......	....	....	......	......	......
147 6	36 1	16 0	1,025	......	......	None..............	None	......	......	......
150 0	37 6	15 6	1,025	......	......	....	None..............	......	......	......

WOODEN STEAM TUGS.

Rig.	Dimensions.						Displacement.	Indicated horse power.	Speed in knots.	Coal capacity.
	Length between perpendiculars.		Breadth.		Mean draft.					
	Feet.	*In.*	*Feet.*	*In.*	*Feet.*	*In.*	*Tons.*			*Tons*
Schooner	137		26		9	6	450	340	10	80
......do	137		26		9	6	450	340	10	80
....	......		......		......		......	340	8.5	....
....	60		14		4		32.08	40	8	8.50
Schooner	137		26		8	6	357	340	10	80
....	85	8	18	10	7		187	147	8.5	....
Schooner	137		26		9	6	450	340	10	80
....	96	9	20	9	9		212	300	13	45
....	92	6	20	11	8		192.4	300	....	35
....	92	6	20	11	8		192.4	300	....	35
....	92	6	20	11	8		192.4	300	....	35

APPENDIX F.—*Tables of vessels*

VESSELS UNFIT

Name.	Built.			Condition or service.	Rig or type.
	When.	Where.	By whom.		
IRON (STEAM).					
Speedwell	1865	Boston	James Tetlow	Condemned at Norfolk	Tugboat
WOODEN (STEAM).					
Franklin	1855-'65	Kittery, Me	United States	Receiving ship, Norfolk, Va.	Housed over
Wabash	1854	Philadelphia, Pa.	....do	Receiving ship, Boston, Mass.	....do
Minnesota	1855	Washington	....do	Receiving ship for training squadron, N. Y.	....do
SAILING.					
Constitution	1797	Boston, Mass	United States	Receiving ship, Portsmouth, N. H.	Housed over
Independence	1837	....do	....do	Receiving ship, Mare Island, Cal.	....do
St. Louis	1828	Washington	....do	Receiving ship, League Island.	....do
Dale	1839	Philadelphia, Pa.	....do	Receiving ship, Washington.	....do
New Hampshire.	1818	Kittery, Me	....do	For use of Naval Reserves, New York.	Ship
Vermont	1818	Boston, Mass	....do	Receiving ship, New York.	Housed over

of the U. S. Navy—**Continued.**

FOR SEA SERVICE.

Dimensions.						Batteries.			Complement.	
Length between perpendiculars.	Breadth.	Mean draft.	Displacement.	Indicated horse power.	Speed in knots.	Main.	Secondary.	Coal capacity.	Officers.	Men.
Ft. In	*Ft. In*	*Ft. In*	*Tons.*					*Tons.*		
137 9	26 0	9 6	450	340	10,0	None	None	80	......	......
365 9	54 3	24 3	5,170	1.050	9.0	4 IX" S. B	1 12-pdr. S. B. hwtzr.	......	......	......
262 7	51 4	23 0	4,650	950	9.15	......	2 20-pdr. B. L. R. 2 12-pdr. S. B. hwtzr.	......	......	......
264 8½	51 4	23 0	4.700	1,000	9.25	8 IX" S. B 1 60-pdr. B. L. R	2 3" B. L. H 2 20-pdr. B. L. R. 3 12-pdr. S. B. hwtzr.	......	......	......
175 0	45 0	20 0	2,200	......	......	4 32-pdr. S. B	1 12-pdr. S. B. hwtzr.	......	......	......
189 0	51 6	21 6	3,270	......	......	6 32-pdr. S. B	3 12-pdr. S. B. (light) 1 12-pdr. S. B. (heavy) 1 3" B. L. H.	......	......	......
126 6	32 8	15 6	830	......	......	None	None...	......	......	......
117 7	33 10	14 9	675	......	......	....do	1 37^{mm} H. R. C	......	......	......
196 3	53 0	25 6	4,150	......	......	....do	None	......	......	......
196 3	53 0	25 6	4,150	......	......	1 6" B. L. R	1 6-pdr. R. F. G 1 3-pdr. R. F. G. 1 1-pdr. R. F. G. 1 37^{mm} H. R. C. 9 12-pdr. S. B. H.	......	......	......

APPENDIX G.

SHOWING CONDITION OF WORK JULY 1, 1893, ON VESSELS IN COURSE OF CONSTRUCTION.

OFFICE OF NAVAL CONSTRUCTOR,
Navy-yard, New York, July 19, 1893.

SIR: In compliance with the Bureau's order of June 6, 1893, No. 7401/93, I submit herewith a detailed report of the condition of work not yet completed, up to July 1, 1893, on the *Maine*, *Cincinnati*, *Terror*, and *Puritan*, together with estimated percentage of total work completed, based on final completion of vessels and outfit ready for sea, the period of time until they will probably be ready for sea, and also a tabulated statement, giving names of vessels under repair July 1, with percentage of work to be done thereon, and estimated time required to do it.

Very respectfully,

F. L. FERNALD,
Naval Constructor, U. S. Navy.

The COMMANDANT, NAVY-YARD, NEW YORK.

Statement of vessels under repair July 1, 1893, percentage of work to be done to complete them, and estimated time required.

Vessel.	Percentage of work to be done to complete.	Time to complete.
		Days.
St. Marys	One-tenth	5
Nantucket	One-tenth	3
Monongahela	Seven-tenths	15
Bancroft	Four-tenths	15
Bennington	Five-tenths	20
Baltimore	Six-tenths	45
Yorktown	Five-tenths	20
Dolphin	Five-tenths	10

STATE OF WORK ON THE TERROR, JULY 1, 1893.

Hull: Side armor, 15 per cent completed; chain pipes, 95 per cent; framing and plating for bridge and flying bridge, 70 per cent.

Hold: Manhole covers, 85 per cent fitted; fittings in storerooms and magazines, 30 per cent; flushing and drainage system, 50 per cent; ventilation system, 70 per cent; voice tubes not fitted.

Main deck: Top of turrets, conning towers, platforms, mast boom, anchor davits and fittings for anchors and davits, boat cradles and fittings for securing boats, awning and guard rail stanchions, not commenced; hatch coamings, 75 per cent completed; deck planking, 25 per cent; deck lights and coal ports cut and 85 per cent fitted; joiner work, 60 per cent.

Berth deck: Planking, 95 per cent completed; joiner work, 80 per cent; gratings, mess lockers, bag racks, etc., not commenced; water-tight doors, 60 per cent.

Miscellaneous: Painting, 30 per cent completed; cementing, 75 per cent completed; boats, one whaleboat transferred, to be replaced; blocks, 70 per cent completed; furniture, 80 per cent completed; estimated percentage of completion based on final completion of vessel ready for sea, 85 per cent. Probable time necessary to complete, ready for trial, counting from the date that armor plates are delivered in their proper order as needed, so as to cause no delay, four months.

STATE OF WORK ON THE PURITAN, JULY 1, 1893.

Hull: Side and turret armor not delivered; alteration of turrets, fitting of barbette armor and life buoys not commenced; smoke-pipe armor fitted; change in barbettes, 30 per cent completed; framing and side-plating of superstructure complete, except connections to barbette armor.

Hold: Covers to manholes, 30 per cent fitted; coal pockets in after end of firerooms, 95 per cent completed; flushing and drainage system, 20 per cent; ventilation system, 30 per cent; steering gear, gratings and voice tubes, not commenced.

Main deck: Anchor davits, and fittings for davits and anchors, boat cradles, awning and guard-rail stanchions, bridges, conning tower and chart house, not commenced; deck lights ready to be fitted; hatch coamings, 70 per cent completed; engine hatch and ventilator casings, 95 per cent; roller path, roller and live rings for turret, 40 per cent; joiner work, 50 per cent; water-tight doors, 65 per cent.

Berth deck: Planking, 60 per cent completed; water-tight doors, 50 per cent; mess lockers, bag racks, etc., not commenced; joiner work, 40 per cent; bulkheads completed, except plates left off for transporting material.

Miscellaneous: Painting, 30 per cent completed. Cementing, 70 per cent completed. Boats, two whale-boats transferred to ships in commission to be replaced. Blocks, 80 per cent completed. Furniture, 80 per cent completed. Estimated percentage of completion, based on final completion of vessel ready for sea, 82 per cent. Probable time necessary to complete, ready for trial, counting from the date that armor plates are delivered in their proper order as needed, so as to cause no delay, six months.

STATE OF WORK ON THE CINCINNATI, JULY 1, 1893.

Exterior hull: Armor not delivered. Life buoys, propeller guard boom, eye bolts for davit guys, cable, boat gripes, swinging boom and fittings, accommodation ladder fittings, and hawse bucklers, not commenced. Plates in wake of sponsons, hammock berthing, bridge, etc., completed as nearly as possible until arrival of armor; fittings in wake of bower anchors, 90 per cent completed; port shutters, 75 per cent; broadside torpedo ports, 85 per cent; bow and stern torpedo ports, tubes and fittings, 60 per cent.

Hold: Water-tight bulkheads around fire room, 65 per cent; fire room air locks, 75 per cent; gratings, fittings in storerooms and magazines, fittings to water-tight doors, not commenced; floodings, flushing and drainage system, 60 per cent completed; ventilation system, 90 per cent; voice tubing laid out.

Gun deck: Tiling in galley, boat cradles and skid beams not commenced; engine room gratings and canopies, 10 per cent completed; planking, 85 per cent; joiner work, 75 per cent; firemen's wash room and skylights, 75 per cent; foundation for steam winches, 80 per cent; casings to engine and boiler room hatches, 95 per cent; evaporator room, 85 per cent; heads, 90 per cent; head tanks, 85 per cent; skylight over engineer's workshop, 75 per cent.

Poop and forecastle: Saddles for anchor davits when hinged down, not commenced; sheet-anchor gear, 10 per cent completed; planking, 90 per cent; chock, 75 per cent; guard-rail stanchions, 75 per cent; search-light platform, 95 per cent; drain plates for rigging, 85 per cent; conning tower, 95 per cent; casing over forward fire room and under chart house, 90 per cent.

Berth deck: Tiling in bath rooms, gratings, fittings to water-tight doors, mess lockers, bag racks, not commenced; engine hatch gratings, 10 per cent completed; door in engine casing, 90 per cent; two sponson air ports, 20 per cent; joiner work, 75 per cent; central station, 75 per cent; refrigerator room, 30 per cent; torpedo tubes cast and ready to be fitted; blowers in place but not secured.

Platform deck: Dynamo room, 90 per cent completed; shafting connection to hand wheel, 60 per cent.

Protective deck: Bulkheads, 95 per cent completed; planking, 20 per cent.

Miscellaneous: Painting, 35 per cent completed; spars, 70 per cent; boats, two whaleboats transferred to ship in commission, to be replaced; blocks, 60 per cent completed; furniture, 90 per cent completed; estimated percentage of completion, based on final completion of vessel ready for sea, 92 per cent; probable time necessary to complete, ready for trial, counting from the date that armor plates are delivered in their proper order as needed, so as to cause no delay, three months.

STATE OF WORK ON THE MAINE, JULY 1, 1893.

Exterior of hull: Side and forward barbette armor not delivered; life buoys, propeller guard boom, eyebolts for davits guys, lashing chains, swinging boom fittings, and hawse bucklers, not commenced; after barbette armor, 25 per cent fitted; two forward mooring shackles, 70 per cent completed, fittings for sheet anchors, 20 per cent; torpedo ports, 70 per cent; gun port shutters, 95 per cent; accommodation ladders, 80 per cent; sea steps ready to be fitted.

Hold: Position of two manholes in engine room to be changed; voice tubes laid out, but not fitted; chain tightening boxes, 90 per cent fitted; fittings in various storerooms, 80 per cent completed; steering gear, 97 per cent; water-tight doors, 95 per cent; armored hatches, 97 per cent; plumbing, flushing, and drainage system, 75 per cent; ventilation system, 80 per cent.

Main and superstructure decks: Turret armor not delivered; alterations to turrets not commenced; boat cradles and eyebolts not commenced; framing and plating of bridge, 80 per cent completed (waiting for conning-tower armor); wood flats, 97 per cent; engine and boiler-room gratings, 85 per cent; hatch coamings, 97 per cent; fittings for bower and sheet anchors, 70 per cent; joiner work, 85 per cent; stanchions for awnings and guard rails, 75 per cent; roller paths, roller and live rings for turrets, 95 per cent; boat cranes, 96 per cent; skylights between forward and midship superstructure, 90 per cent; chart house, 50 per cent; hatch canopies and fittings 10 per cent.

Berth deck: Planking 80 per cent completed; joiner work, 80 per cent; fittings in workshops, washrooms, etc., 70 per cent; hammock hooks laid off; bag racks, mess lockers, gratings, etc., not commenced.

Miscellaneous: Painting primed; cementing 95 per cent completed. Boats: Two whale boats, barge, and gig not commenced. Furniture, 90 per cent completed. Blocks, 60 per cent completed. Estimated percentage of completion based on final completion of vessel ready for sea, 94½ per cent. Probable time necessary to complete, ready for trial, counting from the date armor plates are delivered in their proper order as needed, so as to cause no delay, 8 months.

NAVAL CONSTRUCTOR'S REPORT,
U. S. NAVY-YARD,
Norfolk, Va., July 7, 1893.

SIR: In compliance with the instructions as contained in the letter of the Bureau of Construction and Repair No. 7401-93 of June 8, 1893, I have the honor to report herewith in detail the actual condition of the work on each vessel building at this navy-yard and the progress of work upon those under repairs.

Photographic views of the *Texas*, *Raleigh*, and *Amphitrite* were taken on the 3d instant and will be forwarded as directed.

TEXAS.

Completed: Keel, stem, sternpost, rudder, stern tubes and struts, longitudinals, transverse frames, diagonal armor bulkheads complete with armor, inner bottom, engine and boiler bearers, manholes, water-tight scuttles, deck beams to main deck to protective deck, to lower deck and platforms, deck plating to lower deck and platforms, mast partners, stanchions, bilge keels, manger, draft figures, hatch coamings on platforms, capstan and windlass, wire nippers, anchor davits, cable bitts, hawse pipes, bow stoppers and all anchor gear, deck pipes, ensign and jack staffs, zinc protectors, heeling ship, after launch, cementing, mast steps.

Outside plating: Eight-tenths complete; not riveted in wake of redoubt; waiting for armor.

Armor, side: Framing and backing complete, ready for armor; armor not delivered.

Armor, redoubt: All fitted and secured except two shutter plates, one starboard, one port; measurements taken and order given for these; eight-tenths completed.

Turrets: Structure complete except top-sighting hoods and bars; top in place but not riveted; upper and lower roller paths and rollers complete; backing of one turret complete, of other five-tenths complete; clip rings eight-tenths complete; waiting for completion of redoubt armor.

Transverse bulkheads: Complete except near redoubt on main deck; storeroom bulkheads to be fitted forward and water-closets, after side; nine-tenths complete.

Coal bunker and fore and aft bulkheads: Complete except floor angles in firerooms fitted, but not riveted; nine-tenths complete.

Central passage: Complete except joiner work and fittings of water-tight doors.

Central magazine and shellroom: Complete except lining and door fittings.

Hydraulic room: Structure complete; four seats finished, four one-half finished; six-tenths complete.

Dyanamo room: Complete except foundations and riveting of altered bulkheads; eight-tenths complete.

Shaft alleys: Complete except riveting; waiting on engineers.

Water-tight doors: Rubber to go on brass strips six-tenths fitted and screwed; rods in coal bunkers four-tenths covered; complete otherwise.

Ordinary doors: Complete except two doors for blower rooms and minor fittings on main deck; eight-tenths complete.

Sluice valves: Complete except two indicators at No. 45 bulkhead and minor fittings; nine-tenths complete.

Sounding tubes: Complete except a few flanges; nine-tenths complete.

Testing water-tight compartments: Complete except central passage; nine-tenths complete.

Deck beams to upper deck: All fitted, secured, except at redoubt; been waiting on armor.

Deck beams to flying deck: Eight-tenths fitted and riveted as far as possible before erection; waiting for mounting of turrets.

Deck plating: Complete except upper deck in wake of redoubt; nine-tenths complete.

Hammock berthing: All fitted; seven-tenths on board and riveted.

Deck plank: Upper deck five-tenths complete; main deck nine-tenths complete; lower deck seven-tenths complete; been waiting on armor.

Hatch coamings and skylights: Complete except engine hatches in wake of armor not riveted up; eight-tenths complete.

Gun ports: Complete except two after shutters of 6-inch sponsons and two housing doors of 6-pounders. All gun circles on main deck complete; nine-tenths complete.

Air ports: Complete except riveting of eight in wake of armor.

Electric-lighting plant: Dynamo rooms ready; waiting for equipment.

Electric storeroom: Structure complete; fittings nine-tenths complete.

Turret ammunition tubes: In place, angles fitted; six-tenths secured.

Magazines and shell rooms: After magazine complete.

Six-inch and secondary magazine: Complete except joiner work.

Central 12-inch: Ventilation five-tenths complete; joiner work not begun, ready for lining. Forward 4-inch: Ventilation six-tenths complete; joiner work not begun; complete otherwise. Forward 6-inch and secondary: Complete except joiner work; nine-tenths complete in all respects.

Torpedo rooms: Structure complete; waiting for instructions.

Chain lockers: Complete except grating on top of lockers.

Storerooms and fittings: Complete except riveting bulkheads on main deck and joiner work; six-tenths complete.

Ventilation: Both blowing engines fitted, seven-tenths of the holes cut, and valves fitted to magazines and platform decks; main ducts run forward frame No. 56. Above protective deck eight-tenths complete.

Air locks for forced draft: Doors to be fitted in central passage; nine-tenths complete.

Drainage and steam pumping arrangements: Main drainage complete and ship pumped out; pipes to be run in central magazine and flood cocks to be fitted; discharge pipes to No. 3 pump to be fitted; valve stems broken by engineers to be replaced; nine-tenths complete.

Hand pumps: Connections to be made to galleys and one discharge pipe to be fitted; nine tenths complete.

Torpedo arrangements: Making patterns for tubes; cleared away ready for cutting holes for broadside tubes.

Armored conning tower: Support fitted, five-tenths riveted, tube fitted in place; armor for tower not arrived.

Passing scuttles: One in central passage and one abaft after ammunition hoist to be fitted; eight-tenths complete.

Supports and fittings for guns: Supports complete; 6-inch gun circles on upper deck being put down; fittings awaiting instructions.

Steering apparatus: Tiller gear and steering engine complete; hand-steering gear complete; lead of ropes and shafting seven-tenths complete.

Stern mooring pipes and warping chocks, bitts: Chocks on upper deck fitted; four bitts to be secured near redoubt; seven-tenths complete.

Boats: One whale boat complete except oars and painting; nine-tenths complete.

Masts and spars: Masts fitted; lower stays fitted; topmasts to go up; nine-tenths complete.
Canopies to upper deck: Complete and fitted forward; five-tenths complete.
Water tanks: To be tested; one manhole to be moved; nine-tenths complete.
Guard rail and stanchions: Three-tenths fitted on upper deck.
Scuppers: Eight-tenths of holes cut and eight-tenths fittings complete.
Coaling scuttles and ports: Nine-tenths castings made for scuttles, nine-tenths ports and chutes complete; holes cut to main deck; six-tenths castings and fittings ready in shop.
Cementing and painting: Cementing nine-tenths complete; painting in magazines and storerooms three-tenths complete.
Fire mains: Holes cut, nine-tenths connections fitted; flushing to water-closets to be fitted, piping not run.

Eighty-four per cent of work completed, based on vessel fitted out and ready for sea.

The completion of the *Texas* has been delayed and the work embarrassed by the nondelivery of armor. The vessel was launched July 28, 1892, and was ready to receive the redoubt and side armor at that time. The redoubt armor was especially necessary to the progress of the work, as it was impossible to complete the upper deck until it was fitted and secured. The four diagonal bulkhead armor plates, for which large apertures had to be left in the side, were delivered on October 13, 1892, and November 12, 1892, two pieces on each date, and fourteen of the sixteen plates of the redoubt were delivered on May 27 and 28, 1893.

All the redoubt plates delivered were in place on June 30, 1893.

The *Texas* will probably be ready for trial by June 30, 1894.

AMPHITRITE.

Completed: All old work interfering with alterations torn out, old hatches closed, new ones cut, cutting out and closing old deck lights, main-deck plating, shutters and scuttles in main deck, berth-deck plating transverse bulkheads, sluice valves and operating gear, manholes to double bottom, sounding tubes, stanchions, superstructure deck framing, beams and plating skid beams, hammock berthing, magazines and shell rooms with stowage and trolleys, passing scuttles, planks sheer, all deck planking, armored smoke pipe and ventilator, wood backing for armor, gun supports, ceiling in hold and store rooms, military mast step, awning room, hatch coamings and canopies on main deck, awning and life-line stanchions on main deck, towing bitts, warping chocks, iron rings and ladders, hatch ladders, hammock hooks, signal and ensign staffs, boat davits and derricks, steam capstan and windlass and winch, hatch cranes, chain lockers, water tanks, deck eyebolts, cabin pantry.
Hatch coamings on superstructure: Complete, skylights ready to be fitted on.
Guard rails and stanchions on bridges: Stanchions of lower bridge complete and at ends of upper bridge; fittings for guard rails eight-tenths complete.
Chain stoppers: Ready for securing, waiting on armor.
Hawse pipes: Complete except fittings into bulwarks, waiting on armor; eight-tenths complete.
Billboards: All parts fitted but not riveted; waiting on armor; nine-tenths complete.
Gratings: Complete on superstructure and gangway platforms.
Boats: One whaleboat complete except painting and oars; one gig complete except painting and oars; one dinghy complete except painting and oars; one first-cutter framing complete, binding and upper strakes on, three-tenths complete; one second-cutter structure complete, gun mount to be fitted, oars and boat hooks made, eight-tenths complete; one third-cutter framing complete, putting on bottom plating, five-tenths complete.
Anchor davit: Complete except fitting upper brace; eight-tenths complete.
Steering apparatus: Steering engine with tiller slide and hand wheel completed, lead of steam-tiller rope complete, steam steering-wheel stands and shafting eight-tenths complete; waiting for conning tower.
Voice tubes: Complete except branches to chart house and conning tower, and mouthpieces and central station connections; eight-tenths complete.
Drainage and pumping arrangements: Complete except testing and overhauling joints and connections. Fire main and connections.
Ventilation: Complete except fittings in coal bunkers, connections in junior and warrant officers' quarters, and two cowls on superstructure. Work delayed by side armor; nine-tenths complete and fitted.
Portable furniture: Complete except junior officers'.
Calking: Eight-tenths complete.

Handling rooms below barbettes: Structure complete, waiting for turrets before finishing.

Fixed-ammunition rooms: Structure complete and joiner work nine-tenths complete.

Belt armor: Seven-tenths delivered, one-tenth fitted ready for putting on, and one plate aft and four forward fitted on and one-half secured.

Barbette turrets: Armor fitted on and secured, lower angles fitted and seven-tenths tap bolted, top angles fitted ready for securing, wooden boundary at base, five-tenths fitted. Tracks and rollers complete, revolving parts waiting for arrival of armor.

Conning tower and armored tube: Supports complete, tube screwed in place, tower ordered but has not arrived.

Armor bolts: Delivered with armor that has arrived; seven-tenths for belt armor delivered, two-tenths fitted.

Bridges: Lower complete except rails and two ladders, upper except planking and rails and ladders; nine-tenths complete.

Pilot house: Structure framing complete in joiner shop; four-tenths complete.

Wardroom: Bulkheads, berths finished, lattice work to go in doors ready, furniture ready to be fitted.

Cabin bulkheads and berths: Complete, transom complete except cushions, one door to be fitted, and furniture ready to be fitted.

Junior officers: Ash table complete ready for fitting; no joiner work done on quarters, waiting on armor.

Warrant officers: Furniture ready to be fitted; joiner work to be done on quarters, waiting on armor.

Storerooms: Ready for stores except fitting of doors.

Captain's office: Structure complete, lattice work and furniture ready for fitting.

Armory: Structure complete, waiting for sizes to make racks and fittings.

Water-closets: Structures complete, fittings one-tenth complete.

Bathrooms: Captain's, joiner work nine-tenths complete, fittings ready to go in, officers', one-tenth fitted.

Galley inclosure: Complete, except fittings and cement.

Fresh and salt water supply: Nine-tenths complete.

Blocks: Nine-tenths complete.

Cooperage: Nine-tenths complete.

Painting: Three-tenths complete.

Bulwarks: Fitted, ready to be riveted and finished, waiting on belt armor, eigth-tenths complete.

Fitting of belt armor in place will be taken up when the vessel returns to dry dock-the undocking having been caused by necessity for using the dock for the *Charleston*.

Ninety per cent of work completed based on vessel fitted out and ready for sea.

The *Amphitrite* has been delayed by nondelivery of the armor; also by change in the design of the revolving turrets. The completion will now depend upon the delivery of armor, but from present prospects the *Amphitrite* will be ready for trial by April 1, 1894.

RALEIGH.

Completed: Keel, stem, sternpost and rudder, stern frame, transverse frames, flat keelson, longitudinals, inner bottom plating and manholes, all deck and skid beams, all deck stringers, plating on poop and forecastle decks and on gun, berth and platform decks, under magazines and shell rooms; plating on protective deck, gutters on gun deck, all transverse bulkheads, divisional bulkheads in coal bunkers, center line bulkheads beneath protective deck and central passage, 6-inch gun supports and stairway to berth deck, gun sponsons for 3-pounders forward and 1-pounders aft, deck stanchions, engine and boiler bearers, shaft bearers, struts and tubes, plank sheers and waterways on poop and forecastle, planking on poop, forecastle and berth deck; port shutters under forecastle, and poop, metal and wooden skylights on poop, hatch coamings and hatches in forecastle, poop, berth, and platform decks; canopies on forecastle, cofferdams complete and packed with cellulose; ammunition lifts, passing scuttles, ash chutes, deck lights, mast partners and steps, windlass bed, windlass and capstan, manger, bow stoppers, deck and hawse-pipes warping and towing bitts, cable bitts, warping pipes, cable nippers, ringbolts, hammock hooks, conning tower, shield and tube, anchor davits and gear for bower and sheet anchors, water-closets for seamen, lavatories for officers, trimming tanks, chain lockers, sounding tubes, forward and abaft engine and boiler spaces, water courses, bilge keels, hatch ladders, chocks for fair leaders, pin rail, fittings for Jacob's ladders, life-buoy guards, swinging booms, ensign staffs, draft figures, search lights and stands foremast with military top, wooden mainmast, topmasts, gaffs, blocks, cooper brass-label plates, canopies on gun decks, coaling scuttles, gratings for engine and boiler hatches, coal-bunker ventilation, overhead railway in coal bunkers, prison, master-at-arms locker, hatch coamings, torpedo arrangements, watch bell, ceiling in hold and store rooms, joiner work in cabins, wardroom, junior and warrant officers' quarters, all pantries, water-closets, iron rounds for ladders, lavatories, side gangways.

Drawings: At work on final general plans.

Outside plating: Complete except in wake of 5-inch gun sponsons; delayed by armor for sponsons.

Bridge: Complete except fitting gratings and railings to ladders.

Pilot house: Complete except ash floor and table.

Magazines: Shell rooms, fixed ammunition rooms, structure, drainage, ventilation, doors, and hatches complete; joiner work nine-tenths complete.

Air ports: Complete except in wake of 5-inch sponsons; waiting for armor; nine-tenths complete.

Portable chutes: Complete except minor fittings to two covers on berth deck.

Paymaster's office. Structure complete except riveting air port in wake of 5-inch sponsons; waiting for armor; joiner work five-tenths complete.

Ventilation: Complete except fitting up connection to blower on forward berth deck.

Dispensary: Structure complete except riveting air port in wake of 5-inch sponson, waiting for armor; joiner work five-tenths completed.

Armory: Structure complete; waiting for sizes to make racks for arms.

Swinging tables and benches for crew: Nine-tenths complete; in shop, ready for fitting on board.

Refrigerating rooms and ice-machine compartment: Complete except fitting in place dripping pans and shelves; waiting on engineers.

Galley house and bed: Complete except fitting in place two sinks and skylight.

Sponsons for 5-inch guns: Complete as far as possible until 4-inch armor is delivered.

Water-tight doors: Complete and fitted except two large doors to blowers at No. 49 bulkhead, eight-tenths complete; two doors at No. 59 bulkhead, nine-tenths complete; eight small doors to valves in central passage, six-tenths complete, and indicators of the four large unfinished doors, nine-tenths complete.

Plank sheers and deck plank: Complete, except outboard in wake of 5-inch guns on gun deck; delayed by armor; nine-tenths complete.

Hammock berthing: Complete except riveting in wake of 5-inch sponsons; waiting for armor; nine-tenths complete.

Fore and aft bridges: Fitted and five-tenths riveted; planking to go on; waiting for armor; six-tenths complete.

Freeing ports: Complete except riveting in wake of 5-inch sponsons.

Firemens' washroom: Complete except fitting lockers and finishing scuppers; nine-tenths complete.

Engineers' workshop: Structure complete and skylight ready to be fitted in place.

Evaporator: Complete except fitting portable plates at sides.

Speaking tubes: Pipes complete to military top, forecastle, chart house, and conning tower, forward torpedo and ammunition-passing room; seven-tenths complete in boiler rooms, and five-tenths complete aft to engine rooms, ammunition-passing room, poop, and torpedoes: eight-tenths complete.

Drainage and pumping: Complete except refitting small piping in wake of boilers and drain pipes in engine rooms.

Scuppers: Complete except two to firemens' wash room, which are nine-tenths complete.

Electric-light installation: Complete except fitting wood casing for wires below protective deck; nine-tenths complete.

Steering arrangements: Steering engine and tillers complete; hand wheels complete; steering gear to poop complete; stands and wheels in conning tower and chart house and on bridge complete; shafting complete; two sheaves to be fitted and rope run in.

Guard rails and stanchions: Complete except on fore and aft bridges; waiting for armor; nine-tenths complete.

Awning stanchions: Complete except in wake of 5-inch sponsons; waiting for armor; nine-tenths complete.

Boat davits: Complete and all fitted in place but four.

Boat cradles: Complete and nine-tenths fitted.

Shot racks: Complete, ready to be fitted.

Attachments for rigging: Complete as far as possible before delivery of armor for sponsons; six-tenths complete.

Lashing boats for securing guns: Three-tenths complete and fitted.

Cementing: Nine-tenths complete inside, six-tenths complete outside; to be renewed where broken.

Painting: Storerooms seven-tenths complete; magazines two-tenths complete; berth deck three-tenths complete; gun deck and forecastle seven-tenths complete; all six-tenths complete.

Boats: 30-foot steam cutter delayed by nonarrival of boiler, copper to go on, canopies, wheel, steering gear, gun and torpedo fittings to be completed, water tanks and coal bunkers to be made, eight-tenths complete; 30-foot sailing launch complete except oars and final coat of paint; two 28-foot cutters complete except final coat of paint; two 26-foot cutters, oars to be made, painting, and gun mounts, five-tenths complete; eight-tenths complete; Dinghy complete; except final coat of paint; whale boat complete except fitting hoisting bolts, finishing up oars and one coat of paint; gig complete except final coat of paint.

Portable furniture: Complete and ready to be fitted on board and secured except one sideboard for cabin, nine-tenths complete; one sideboard for wardroom nine-tenths complete, and fitting a few locks.

Bow ornament: Fitted and sent to Washington navy-yard to be carved.

Ninety-five per cent of work completed, based on vessel fitted out and ready for sea.

The completion of the *Raleigh* has been much delayed by the non-delivery of the eight 4-inch armor sponsons for the spar-deck battery, making it necessary to hold up a considerable amount of work on the spar deck, the bulwarks, the boat davits, and the mounting of the battery. None of these sponsons are yet delivered. Three have been shipped but no information is at hand as to when the balance will be delivered. If they are satisfactorily delivered by August 1st, the vessel should be completed in this department by November 1, 1893.

Vessels under repair.

Name.	Percentage to complete.	Estimated time to complete from July 1.
		Days.
Newark	Nine-tenths.	63
Charleston	One-tenth...	5
Essex	Nine-tenths.	90

Very respectfully,

FRANCIS T. BOWLES,
Naval Constructor, U. S. Navy.

Capt. E. E. POTTER, U. S. Navy,
Commandant.

NAVAL CONSTRUCTOR'S OFFICE,
Navy-yard, Mare Island, Cal., July 7, 1893.

SIR: Referring to letter from the Bureau of Construction and Repair, No. 7401-93 of June 6, 1893, calling for report on the condition of work on United States steamer *Monadnock* on July 1, 1893, I have the honor to submit the following report, following the headings of paragraphs in the specifications:

Main deck armor plating: Upper and lower courses are completed, except two starboard and two port plates over armor belt which are in place but yet to be riveted.

Berth-deck plating: Completed.

Transverse bulkheads: Are completed, except Nos. 57, 68, and 77, which are now being bolted up, but cannot be completed until the large pieces of machinery are in place.

Fore and aft bulkheads: To be generally gone over to insure water-tightness, completed, except coal-bunker bulkheads in boiler room.

Longitudinal passageway bulkheads: Completed.

Longitudinal coal-bunker bulkheads: A little calking yet to be done in order to complete.

Water-tight doors and sluice valves: Doors completed and hung, except gaskets, Nos. 47, 57, 68, and 77 are made, but not yet fitted in place. Twelve sluice valves have been fitted in place, the others are almost ready to be fitted. Steel doors, not water-tight, are completed.

Chain lockers: Steel work completed; gratings completed except two pieces; shackles for securing and slipping cable are made and secured in place.

Stanchions: Completed and erected, except three to be erected in engine and boiler rooms.

Superstructure framing: Completed.

Superstructure deck beams: Completed.

Superstructure plating: Completed except the two end plates, which can not be erected until the turrets are in place.

Superstructure deck stringers, tie plates, and plating: Completed.

Half beams and ledges: Completed.

Skid beams: Completed; a light bridge connecting skid beams fore and aft is completed. Boat chocks are completed on port side and almost completed on starboard side.

Hammock berthing: Steel work completed.

Magazines: Steel work completed except tops of light boxes.

Shell rooms: Steel work completed except tops of light boxes.

Handling rooms: Forward and after steel work completed; doors made but not fitted.

Fixed ammunition rooms: Steel work completed.

Passing scuttles: Through main deck are completed.

Belt armor: Side lined off and plates ordered; templates prepared and shipped to armor-makers.

Barbette turrets: Forward and after turret supports are completed; doors made and fitted; backing plates for both turrets are in place; outside top angle, inside bottom angle, and top rim plate are in place and riveted; work on racks and roller paths is completed except cementing; the wood under roller track of both turrets is in place and surfaced.

Armored smoke pipe and ventilator: Ventilator from engine rooms completed, including armor; smoke-pipe armor not received.

Wood backing: Fitting and securing in place the vertical course of wood backing on the starboard side almost completed; on the port side about one-fourth is fitted. But little over half of the teak for this work has been received, and progress is greatly retarded by the nondelivery of this material, which is now nine months overdue.

Gun supports: Completed except the erection of the vertical stiffening plates for hammock berthing mounts, which is now being done.

Bridge: The iron work is nearly all erected and bolted together. This work has been held back in hopes of receiving the conning tower.

Military mast: Completed, except gratings for tops and minor fittings. Has been stepped.

Mast step: Completed.

Dispensary: Steel work completed and door hung.

Engineers' and ordnance workshop: Steel work completed and door hung.

Pantries: Wardroom steel work completed and door cut.

Water-closets: Steel work of wardroom and crew's water-closets is completed; troughs made but not fitted.

Mess tables and benches for crew: 10 mess tables, 20 mess benches, 12 mess chests, and 2 petty officers' tables and racks are completed.

Hatch coamings and skylights: The main and superstructure decks' hatch coamings are completed; coamings on berth deck are completed except two.

Gratings and hatch covers: The six main-deck hatch covers are fitted; five completed with hoisting gear; work on other well advanced.

Awning and life-line stanchions: Completed in shop except boring for the heel pin and galvanizing. The braces for stanchions are made, but can not be fitted until the stanchions are erected.

Guard rails and stanchions: Completed in shop except boring for guard rail, which work is now being done.

Hatch cranes: Completed and erected in place.

Deck lights: All deck-light and ventilator castings are made; all ventilator castings are fitted in place; 91 deck-light castings are erected, the remainder are being fitted. Lenses are fitted in lense rings.

Air ports: All hoods and ports are completed and lenses fitted in lense rings.

Coaling scuttles: Completed.

Water tanks: The stationary water tanks are completed, except covers for tanks, and are now ready for testing; all portable tanks yet to be made.

Chain stoppers: Work well advanced.

Hawse pipes: Completed except fitting covers; sheaves for lead of cable from windlass engine are secured in place; holes in bulkhead cut; patterns for bucklers made.

Mooring bitts: Completed and erected in place.

Towing bitts: Completed and erected in place.

Warping chocks: Completed and erected in place.

Iron rungs and ladders: In coal bunkers, military mast, and ventilators leading from main to superstructure deck, also in after companionway leading from main to berth deck are completed.

Hammock hooks: Are all made, but yet to be drilled to receive the securing bolt and galvanized.

Eyebolts in beams and ringbolts in deck: About one-half of these bolts are made; work progressing on the remainder.

Canopies: Heel sockets for main-deck hatch-canopy frames are completed and partly erected; work is progressing on the remainder. Material for frames is under contract.

Swinging booms for boats: Iron work completed.

Boats: Three cutters completed; Dinghy, about eight-tenths completed; Gig, about three-tenths completed; work commenced on steam launch and whale boat.

Boat davits, derricks, and cradles: Boat davits are completed and erected; boat cradles are completed and erected, except the cradle for steam launch; two derrick booms are completed and erected.

Anchor crane: Pattern out and work progressing.

Steam capstan, windlass, and winch: The steam capstan and windlass are completed except steam pipe connections; winch not yet received.

Windlass bed: Completed.

Steering apparatus: Foundation and engine erected: quadrant nearly done. Work suspended pending possible changes.

Drainage and pumping arrangements: About one-half of the manifolds and valves for this work have been cast and are now being finished in the machine shop. Part of the material ordered for this work has been received and the installation of the drainage and pumping system will be begun as soon as enough material is on hand.

Ventilation: A small lot of material for this work has just been received.

Cooperage: All of the cooperage and blocks are completed.

Cement: Five gangs of three men each are at work cleaning and scaling double bottom preparatory to cementing.

Testing water-tight compartments, tanks, etc.: Most of the compartments of the old double bottom have been tested, also old collision bulkhead and extreme after compartment. There still remain six compartments in double to be tested, also magazine, shell rooms and stationery tanks.

Where headings of paragraphs of specifications are not mentioned no work has been done on them.

Work completed, including old work done under contract, based on the final completion of the vessel and outfit ready for sea, I estimate at 57 per cent.

I have the honor to forward herewith three views of the vessel (negatives with two prints of each) taken during the last days of June.

Very respectfully,

D. W. Taylor,
Naval Constructor, U. S. N.

The Commandant, Navy-yard, Mare Island, Cal.

Office of Superintending Constructor, U. S. Navy,
Wm. Cramp & Sons Ship and Engine Building Works,
Philadelphia, July 25, 1893.

Sir: Complying with the Bureau's order of the 6th ultimo, No. 7400–93, calling for photographic views of the vessels building at this yard under my supervision, and likewise for a special report giving in detail the condition of the work on the same. I have the honor to submit the following report, showing their condition on the 1st instant.

U. S. S. NEW YORK.

Ship launched December 2, 1891, official trial, May 16, 1893, now completing at dock.

Keel, stem, sternpost, tranverse frames, rudder, flat keelson plates, longitudinals, outside plating, deck beams, inner bottom, coal bunker and other fore-and-aft bulkheads, deck-plating stringers, etc., stanchions between decks, etc., engine, boiler, and shaft bearers, shaft tubes and struts, water-tight doors, and armor on the outside of hull: Completed.

Barbettes and turrets for 8-inch guns: After barbette completed; forward barbette ready for armor; turrets well advanced; armor secured.

Armor protection to 8-inch guns and secondary battery: Nearly completed.

Gun supports for 8-inch amidship guns, conning-tower shield, tube and foundation, hatch coamings, skylights and inclosures, cofferdams and cellulose packing: Completed.

Bilge keels and magazines, except light boxes, shell rooms, fixed-ammunition rooms, and torpedo-manipulating rooms: Fittings well advanced.

Passing scuttles: Completed, except hoists.

Torpepo fittings to hull: Well advanced.

Hammock berthings, coaling scuttles, trunks and chutes, ash chutes, mast stops, chain lockers, scuppers, drainage and pumping, hand pumps, fire mains and connections, water-closets, and lavatories for crew: Completed.

Plank-sheer, deck plank, water tanks, trimming tanks, freeing ports, mast partners, prisons, firemen's washrooms, water-closets and urinals for crew, steering arrangements and seatings, chart house, air ports, ventilation, ventilation of coal bunkers, and forced draft in fire rooms: Completed.

Wood floor in coal bunkers, ceiling in hold, storerooms, etc., also in living spaces, and sail and awning rooms: Completed.

Ordnance and engineer's workshops: Ready for fittings.

Engineer's log room and storerooms, lamp rooms, steam winches, windlass and bed, capstans, deck pipes, hawse pipes, cable bitts, bow stoppers, ringbolts, bow chocks, warping bitts, warping chocks, cable nippers, anchor beds, boat davits and cradles: Completed.

Wardroom, junior and warrant officers' quarters, and cabins, and staterooms and other rooms on the gun deck: Completed, except a few minor details.

Lavatories and water-closets and urinals for offices, offices for admiral, captain, executive officer, navigator, and paymaster, also surgeon's examining room, dispensary, pantries, armories, galleys, band room, shelves, lockers, etc.: Completed, except a few minor details.

General and other storerooms, main-hold scuttles, sounding tubes, armor gratings and covers to openings in the protective-deck, gratings and hatch covers, canopies to hatches, ladders to hatchways: Completed.

Iron rounds on ladders, side ladders, sea steps, guard rails, and stanchions: Well advanced.

Mess and clothes lockers for crew, swinging tables and benches for crew, reels, hammock hooks, watch bell, awning stanchions, eyebolts in beams, mooring staples: Completed.

Shot racks and rifle racks: Nearly completed.

Attachments for rigging: Completed.

Chocks for fair leaders, pin rails, brass rubbing plates, brass label plates: Completed.

Jacob's ladders, life buoys, swinging booms, ensign staffs, stern gallery, head and stern ornaments, figures for draft of water, and cement work: Completed.

Cleaning and polishing hard-wood work, and painting: Well advanced towards completion.

Boats: Nearly completed.

It is estimated that 98 per cent of the hull work, based on the ship fitted out for sea, has been completed, and that she will be ready for delivery to the Government about September 1, 1893.

U. S. S. COLUMBIA.

Ship was launched July 26, 1892, and is now completing alongside dock.

Keel, stem, sternpost, stern frame, rudder, transverse frames, flat keelson plates, and longitudinals: Completed.

Frames of bridge deck houses, outside plating: Completed, except above hammock berthing.

Inner bottom: Completed, compartments being tested.

Deck beams, coal bunker and other fore-and-aft bulkheads, deck plating, stringers, etc., glacis plates to engine hatches, and transverse water-tight bulkheads: Completed.

Gutters on decks: Completed except gratings.

Stanchions, engine, boiler, and shaft bearers and shaft tubes and struts: Completed.

Armor protection for 4-inch guns and secondary battery: Not received.

Supports for 6 and 8-inch guns: Completed, except details of door.

Conning tower and shield tube and foundation: Complete, except interior fittings.

Hatch coamings and skylights and inclosures to same: Metal work completed and woodwork completed in shop.

Cofferdams: Completed, tested, and ready for cellulose.

Bilge keels: Completed.

Magazines: Completed, except fittings and testing after ones,

Shell rooms, fixed ammunition rooms, and torpedo-manipulating room: Metal work completed and testing completed forward; joiner work commenced.
Passing scuttles: Holes cut.
Hammock berthing: Completed, except eyebolts, hooks, and woodwork.
Coaling scuttles and coaling chutes: Completed, except special scuttles.
Ash chutes: Commenced.
Mast steps, mast partners and masts, also chain lockers: Completed and masts stepped.
Scuppers, freeing ports, and drainage and pumping: Completed, except shutters to freeing ports and a few branch suction pipes.
Plank-sheers, water tanks, and trimming tanks: Completed, except fittings to tanks.
Refrigerating room and prison: Metal bulkheads completed; no fittings commenced.
Firemen's washroom, lavatory for crew, and crew's water-closets and urinals: Completed, except pipe connections.
Seatings for steering arrangements, and steering arrangements: Seatings completed and steering gear being erected on board.
Chart house: Being erected on board.
Air ports: Completed, except above hammock berthing and minor details.
Ventilation: The main ducts are completed and branches nearly completed. The fitting of valves and louvers is well advanced.
Forced draft in fire rooms: Completed, except a few details.
Wood floor in coal bunkers: Completed.
Ceiling in hold and storerooms, woodwork and fittings in sail and awning rooms, ordnance workshops, engineer's storerooms, engineer's log room, and lamp room: Joiner work and fittings in hand.
Oil tanks: Completed, except fittings.
Steam winches: Not received.
Windlass bed, windlass, capstans, deck pipes, hawse pipes, cable bitts, bow stoppers, bow chocks, warping or towing bitts, warping chocks, steel-wire cable nippers, and anchor crane: Completed, except bucklers to hawser pipes.
Anchor beds: Completed, except fittings.
Wardroom, junior and warrant officers' quarters, captain's cabin, staterooms, etc,, lavatories for officers, water-closets and urinals for officers, offices for captain, executive officer, navigator, and paymaster, dispensary, and pantries: Bulkheads completed, lockers well advanced, fittings being installed, furniture not provided.
Galley beds, bulkheads, etc.: Completed, except wire screen and cement work.
General and other storerooms: Bulkheads completed and ready for fittings except navigator's and ordnance storerooms.
Manhole scuttles: Completed.
Sounding tubes: Nearly completed.
Armor gratings and covers to openings in protective deck: Completed.
Gratings and hatch covers and ladders: Ready to be fitted on board.
Iron rounds on ladders, also side ladders and sea steps: Completed, except side ladders have not been fitted on board.
Guard rails and stanchions, also awning stanchions: Commenced.
Swinging tables and benches for crew: Completed in shop.
Chronometer and compass locker, master at arm's locker, and signal locker: Nearly completed.
Mooring staples, attachments for rigging chain, plates, bolts, etc., figures for draft of water: Completed.
Portable furniture: Wardrobes and bureaus completed in shop.
Painting: Completed as required for preservation during progress of work.
Cement work inside and out: About one-half completed.

It is estimated that 89 per cent of the hull work, based on the ship fitted out for sea, has been completed, and that she will be ready for contractors' trial about July 30, 1893, and for delivery to the Government about January 15, 1894.

U. S. S. MINNEAPOLIS.

Ship on the stocks; launching ways commenced.
Keel, stem, sternpost, stern frame, rudder, transverse frame, framing of bridge deck houses, longitudinals, and outside plating, except above upper deck: Completed.
Inner bottom: Completed except manholes and testing.
Deck beams, coal bunker, and other fore-and-aft bulkheads, except doors, deck plating, stringers, etc., transverse water-tight bulkheads, except in boiler space; also stanchions between decks: Completed except small portions of fore-and-aft bulkheads above protective deck.

Engine, boiler, and shaft-bearers, shaft tubes, and struts: Completed, except boiler bearers are not riveted.
Water-tight doors: About one-half in place; fittings not secured.
Supports for 6 and 8 inch guns: Completed, except doors.
Conning tower, shield, tube, and foundation: Foundation completed; other parts ready to be placed.
Hatch coamings, skylights, and inclosures to same; also, cofferdams: Ready for riveting.
Bilge keels: Completed.
Magazines, shell rooms, fixed-ammunition rooms, torpedo-manipulating rooms: Bulkheads completed; no doors or fittings.
Hammock berthing: Frames in place and portions of the plating ready for riveting.
Coaling chutes: Commenced.
Chain lockers: Nearly completed.
Scuppers, drainage, and pumping: Holes cut in decks and bulkheads, and pipes and suctions with valves being fitted.
Water tanks, trimming tanks: Ready for fittings and testing.
Mast partners: Completed.
Refrigerating rooms: Just commenced.
Prisons and firemen's wash rooms: Completed, except doors and fittings.
Seatings for steering arrangements: Completed.
Air ports: Holes cut and fitting of ports commenced.
Ventilation: A few holes cut in protective deck, and work on ducts, etc., just commenced.
Forced draft in fire rooms: Ready for riveting.
Windlass bed: Completed.
Windlass, capstans, deck pipes, hawse pipes, cable bitts, cable nippers: Being erected or fitted on board.
Anchor beds: Being riveted.
Galley beds and bulkheads: Complete, except wire screen.
Manhole scuttles: Holes cut.
Armor gratings and covers to openings in protective deck: Work commenced.
Side ladders, swinging tables, and benches: Nearly completed in shop.
Mooring staples, figures for draft: Completed.
Painting: Only such as is necessary for preservation during progess of work.

It is estimated that 70 per cent of the hull work, based on the ship fitted out for sea, has been completed, and that she will be ready for contractors' trial about April 1, 1894, and for delivery to the Government about July 15, 1894.

U. S. S. INDIANA.

Ship was launched February 28, 1893, and is now completing alongside dock.
Keel, stem, sternpost, stern frame, rudder, transverse frames, outside plating, flat keelson plates, inner bottom, and longitudinals: Completed, except manholes to inner bottom.
Transverse water-tight bulkheads, fore-and-aft wing or side-bunker bulkheads, ammunition passage bulkheads, and fore-and-aft coal bunker bulkheads above protective deck; Completed, except doors.
Longitudinals, bulkheads: Middle line ready for riveting.
Water-tight doors: Commenced.
Deck beams, deck-plating stringers, and tie plates, including protective deck: Completed.
Magazines, shell rooms, fixed-ammunition rooms, ready-service magazines, and torpedo-manipulating rooms: Metal work ready for testing; no fittings.
Passing scuttles: Holes cut.
Cofferdams: Ready for testing.
Foundation for steering arrangements: Completed, except under engine.
Chain lockers: Completed, except covers.
Water tanks and trimming tanks: Completed, except connections.
Firemen's wash rooms, water-closets, and urinals for crew and lavatory for crew: Completed, except doors and fittings.
Air ports: Holes cut.
Engineer's workshop, ordnance workshop, engineer's log room: Ready for fittings.
Coaling scuttles: Hole cut.
Coaling chutes: Completed, except doors.
Engine, boiler, and shaft-bearers: Completed.
Military mast and tops: Commenced.
Windlass bed and windlass: Completed.
Hawse pipes: Completed.

Drainage and pumping: Completed in inner bottom.
Ventilation, ventilation of coal bunkers, and forced draft in fire room: Commenced.
Framing behind armor: Completed.
Armor plating: Diagonal armor completed.
Turrets for 13-inch guns: Barbette framing and turret foundation completed; wood backing commenced.
Barbettes and turrets for 8-inch guns: Foundations commenced.
Conning tower, shield tube, and foundations: Foundations nearly completed.
Distilling apparatus: On board.
General and other storerooms, lavatories for officers, water-closets and urinals for officers, dispensary, and armory: Ready for fittings.
Swinging tables and benches for crew: Completed in shop.
Side ladders: Commenced in shop.
Bow chocks, warping and towing bitts, and warping chocks: Completed.
Anchor beds: Completed except fittings.
Shaft tubes and struts: Completed.
Mooring staples: Commenced.
Figures for draft: Completed.
Sounding tubes: Nearly completed.
Painting: Sufficient for preservation during progress of work.

It is estimated that 73 per cent of the hull work, based on the ship fitted out for sea, has been completed, and that she will be ready for contractor's trial about February 1, 1894, and delivery to the Government about June 1, 1894.

U. S. S. MASSACHUSETTS.

Ship was launched June 10, 1893, and is now completing along side dock.

Keel, stem, stern post, stern frame, rudder, transverse frames, outside plating, inner bottom, and longitudinals: Completed except manholes to inner bottom.
Transverse water-tight bulkheads, fore and aft wing or side-bunker bulkheads, ammunition-passage bulkheads and fore and aft coal-bunker bulkheads above protective deck: Completed except doors.
Longitudinal bulkheads: Middle-line bulkheads ready for riveting.
Water-tight doors: Nearly completed except fittings.
Deck beams: Completed except bridge.
Deck-plating stringers and tie plates, including protective deck: Completed.
Magazines, shell rooms, fixed ammunition rooms, ready-service magazines, torpedo-manipulating rooms: Bulkheads completed ready for testing; no fittings in place.
Passing scuttles: Holes cut.
Hatch coamings, skylight, and inclosures: Metal work completed except doors.
Cofferdams: Completed except doors, fittings, and testing.
Bilge keels: Completed.
Foundation for steering arrangements: Well advanced.
Chart house: Commenced in shop.
Chain lockers: Completed except covers.
Water tanks and trimming tanks: Completed except pipe connections and testing.
Firemen's wash-rooms, water-closets, and urinals for crew, and lavatory for crew: Commenced.
Air ports: Holes cut.
Engineer's workshop, ordnance workshop, and engineer's log room: Ready for fittings.
Hammock berthing: Ready for riveting.
Coaling scuttles: Holes cut.
Coaling chutes: Completed except doors.
Engine, boiler, and shaft bearers: Completed.
Scuppers: Commenced.
Military mast and tops: Commenced.
Windlass bed and windlass: Bed completed, and windlass being erected on board.
Capstans and deck pipes: Ready to go on board.
Hawse pipes: Completed.
Drainage and pumping: Completed in inner bottom; other parts commenced.
Ventilation, ventilation of coal bunkers, and forced draft in fire rooms: Commenced.
Framing behind armor: Completed.
Armor plating: Diagonal armor completed.
Turrets for 13-inch guns: Barbette framing and turret foundation completed.
Barbettes and turrets for 7-inch guns: Foundations commenced.
Distilling apparatus: On board; no connections made.
Swinging tables and benches for crew, also reels: Completed in shop.
Side ladders: Commenced in shop.

Warping and towing bitts: Completed.
Anchor beds: Completed except fittings.
Shaft tubes and struts: Completed.
Mooring staples, figures for draft of water: Completed.
Painting: Completed as necessary for preservation during progress of work.

It is estimated that 70 per cent of the hull work, based on the ship fitted out for sea, has been completed, and that she will be ready for the contractor's trial about March 1, 1893, and for delivery to the Government about July 1, 1894.

U. S. S. IOWA.

Work on the mold-loft floor is nearly completed; scrive board, also molds for stem and sternposts have been commenced.

It is estimated that the ship will be ready for contractor's trial about October 1, 1895, and for delivery to the Government about February 11, 1896.

U. S. S. BROOKLYN.

The lines are faired on the mold-loft floor; inner bottom and other work in mold loft has been commenced.

It is estimated that the ship will be ready for contractor's trial about October 1, 1895, and for delivery to the Government about February 11, 1896.

The photographic views have all been taken and are now being printed. They, with the negatives, will be forwarded by express in a few days.

Very respectfully, your obedient servant,

J. F. Hanscom,
Naval Constructor, U. S. Navy, Superintending Constructor.

Chief of Bureau of Constuction and Repair,
Navy Department, Washington, D. C.

Office of Naval Constructor
Superintending Hulls of Vessels for U. S. Navy,
San Francisco, Cal., July 10, 1893.

Sir: In accordance with the Bureau's instructions of the 6th ultimo I have the honor to make the following statement as to the condition of work on the hull of the battle ship No. 3 (*Oregon*) on the 1st instant:

Flat keel plates: Completed.
Vertical keel: Completed.
Stem: Completed.
Sternpost: Completed.
Stern frame: Completed.
Rudder: Completed.
Transverse frames: Completed to main deck.
Outside plating: Completed below armor shelf; above armor shelf plates in place abreast citadel, forward and abaft citadel plates being fitted in place.
Flat keelson plates: Completed.
Inner bottom: Completed.
Longitudinals: Completed.
Transverse water-tight bulkheads: Completed below berth deck; about 50 per cent in place on berth deck; material for others being fitted.
Longitudinal bulkheads: Completed below berth deck in citadel and below protective deck in ends; forward above protective deck all are in place but not completely riveted; aft above protective deck all but the center-passage bulkheads are in place but not riveted; on berth deck bulkheads are almost all in place and now being riveted.
Ammunition passages: Sides completed; deck plating in place and riveted.
Water-tight doors: All frames below berth deck except storeroom doors aft are in place; balance completed in shops.
Main-deck beams: All in place.
Berth-deck beams: All in place.
Protective-deck beams: Completed.
Platform-deck beams: Completed.
Splinter-deck beams: Completed.
Superstructure-deck beams: Eight on board, ready for fitting in place.
Shaft struts: Completed.
Bridge beams: Nothing done.

Skid beams for boats: Nothing done.
Deck plating: Platforms completed; protective deck completed; berth deck within citadel, lower course completed; upper courses all in place and riveted but eight plates; berth deck forward completed except that left for fitting diagonal armor, aft only a few plates in place; splinter deck completed; main deck all in place except a few plates in wake of 13-inch guns; on berth and main decks plates in wake of boilers not yet riveted.
Plank-sheers or water ways: Nothing done.
Deck planking or covering: Nothing done.
Deck coating: Nothing done.
Grating and hatch covers: Nothing done.
Armor gratings in protective deck: Grating bars and rests ready for fitting in engine boiler and ventilating hatches.
Gutters on decks: Outer angle in place forward and abaft of superstructure; inner angle forward and abaft of superstructure in place but not riveted.
Supply of ammunition: Nothing done.
Magazines: Light boxes all made and fitted but not yet in place.
Shell rooms: Nothing done.
Fixed-ammunition rooms: Nothing done.
Ready-service magazines: Nothing done.
Torpedo-manipulating rooms: Nothing done.
Passing scuttles: Those of auxiliary magazines fitted in place on berth deck.
Torpedo fittings to hull: Nothing done.
Hatch coamings, skylights, and inclosures: Nothing done.
Coffer-dams: All erected forward but riveting not complete; aft in place from frame No. 74.
Foundations for steering arrangements: Completed.
Steering arrangements: Hydraulic gear in place; hand gear completed in shops.
Boat cranes: Angles and plates are bent and being punched; engines completed in shops.
Chart house: Nothing done.
Bulkheads and fittings in officers' quarters: Nothing done.
Chain lockers: Completed.
Water tanks: Completed forward; aft, angles are in place and plates punched, but not yet in place.
Trimming tanks: Completed.
Prisons, etc.: Nothing done.
Firemen's washroom: Nothing done.
Water-closets and urinals for crew: Bulkheads in place.
Lavatory for crew: Nothing done.
Air ports: Completed in shops.
Deck lights: Completed in shops.
Wood floor in coal bunkers: Angles in place.
Water courses, etc: Cut in double bottom.
Ceiling in hold, storerooms, etc: Nothing done.
Sail or awning room: Nothing done.
Engineers' workshop: Nothing done.
Ordnance workshop: Nothing done.
Engineers' log room: Nothing done.
Engineers' storeroom: Nothing done.
Hammock berthing: Nothing done.
Coaling scuttles: Nothing done.
Coaling chutes: Nothing done.
Ash chutes: Nothing done.
Engine boiler and shaft bearers: Completed.
Refrigerating room and ice-machine room: Nothing done.
Scuppers: Nothing done.
Military mast and tops: Nothing done.
Oil tanks: Nothing done.
Steam winches: Completed in shops.
Windlass bed: On board being fitted in place; casing ready for riveting in place.
Windlass: On board being placed in position.
Deck pipes: Nothing done.
Hawse pipes: Nothing done.
Stern pipes: Nothing done.
Drainage and pumping: Completed in double bottom except strainers and elbow connections for different compartments; main pipes and valves are completed in place outside double bottom in fire rooms.
Pumps: 95 per cent completed in shops.

Ventilation: Casing for forward blowers in place, not riveted; fans completed in shops, engines well advanced.
Ventilation of coal bunkers: Nothing done.
Forced draft in fire rooms: Blower casing erected but not riveted.
Framing behind belt armor: Completed.
Framing behind diagonal armor: Completed.
Armor plating: 14-inch diagonal armor completed except 25 bolts and 36 nuts aft; 4-inch casemate armor received; forward and aft diagonal armor being fitted. backing plates in place on sides.
Backing behind armor: Completed for belt armor; completed for diagonal armor forward and aft.
Turrets for 13-inch guns: Supports for forward turret fitted in place; top and outside plates fitted, inside plates being fitted; after turret supports erected and top plating fitted.
Barbettes and turrets for 8-inch guns: Nothing done.
Conning tower, shield, tube, and foundation: Tube being fitted.
Supports to diagonal armor: Completed.
Torpedo-net rooms: Nothing done.
Galley beds, etc.: Nothing done.
Distilling apparatus: Nothing done.
General and other storerooms: Nothing done.
Lavatories for officers: Nothing done.
Water-closets and urinals for officers: Nothing done.
Captain's office: Nothing done.
Executive officer's office: Nothing done.
Navigator's office: Nothing done.
Paymaster's office: Nothing done.
Surgeon's examining room: Nothing done.
Dispensary: Nothing done.
Pantries: Nothing done.
Armory: Nothing done.
Canopies to hatches: Nothing done.
Ladders to hatchways, etc.: Nothing done.
Iron rounds of ladders: All in place on bulkheads forward below berth deck.
Brass rubbing plates, etc.: Nothing done.
Label plates: Nothing done.
Jacob's ladder: Nothing done.
Running lights: Nothing done.
Life buoys: Nothing done.
Swinging booms: Nothing done.
Swinging tables and benches for crew: Nothing done.
Reels: Nothing done.
Hatch cranes: Nothing done.
Chronometer and compass locker: Nothing done.
Master-at-arms' inclosure: Nothing done.
Signal lockers: Nothing done.
Lumber irons: Nothing done.
Ladders (side), sea steps, etc.: Nothing done.
Gangway boards: Nothing done.
Guard rails and stanchions: Nothing done.
Shot racks and rifle racks: Nothing done.
Attachment for rigging, plates, bolts, etc.: Nothing done.
Bow chocks: Nothing done.
Warping or towing bitts: Nothing done.
Warping chocks: Nothing done.
Steel-wire cable nippers: Nothing done.
Anchor davits: Completed.
Anchor beds: Completed, except slight riveting.
Cable bitts: Nothing done.
Bow stoppers: Nothing done.
Boat davits and cradles: Nothing done.
Shaft tubes: Completed.
Shaft struts: Completed.
Platforms for guns: Nothing done.
Lashing bolt and shackles for securing guns, etc.: Nothing done.
Chocks for fair leaders: Nothing done.
Hammock hooks: Nothing done.
Watch bell: Completed in shops.
Awning stanchions: Nothing done.
Eyebolts in beams: Nothing done.

Mooring staples: Nothing done.

Cleaning or painting steel or iron WORK: Eighty per cent of all completed work has been cleaned and painted.

Ensign and signal shafts: Nothing done.

Head and stern ornaments: Nothing done.

Man-hole scuttles: Completed and in place in inner bottom.

Sounding tubes: Nothing done.

Mess and clothes lockers for crew: Nothing done.

Painting, graining, and polishing: Nothing done, except the first coat on metal work.

Electric plant: Dynamo engines about 50 per cent completed in shops.

Dynamo room and electrical storeroom: Nothing done.

Voice pipes and telephones, call bells, etc.: Nothing done.

Testing water-tight compartments, tanks, etc.: Water-tight compartments tested from forward to frame No. 35.

Ringbolts in deck: Nothing done.

Portable furniture: Nothing done.

Cooperage: Nothing done.

Miscellaneous outfit: Nothing done.

Boats: Nothing done.

Upholstering: Nothing done.

Casing to pipes, valve rods, etc.: Nothing done.

Sentries' walks and stools for leadsmen: Nothing done.

Stowage for spare coal bags: Nothing done.

Flash plates: Nothing done.

Cement or other coatings in double bottom and elsewhere: Double bottom has been given a coat of red lead.

In my opinion, this vessel is 57 per cent completed, on the basis that 100 per cent completion represents her condition when ready for sea in all respects in all matters coming under the cognizance of the Bureau of Construction and Repair.

If all the armor is delivered by February 1, 1894, this vessel will, in my opinion, be ready for her contractor's trial about August 1, 1894, and for delivery to the Government about September 15, 1894.

Very respectfully, your obedient servant,

A. W. STAHL,
Naval Constructor, U. S. Navy, Superintending Constructor.

Chief Constructor T. D. WILSON, *U. S. Navy,*
Chief of the Bureau of Construction and Repair,
Navy Department, Washington, D. C.

OFFICE OF NAVAL CONSTRUCTOR,
SUPERINTENDING HULLS OF VESSELS FOR U. S. NAVY,
UNION IRON WORKS,
San Francisco, Cal., July 10, 1893.

SIR: In accordance with the Bureau's instructions of the 6th ultimo, I have the honor to make the following statement as to the condition of work on the hull of "Cruiser No. 6" on the first instant:

Flat keel plates: Completed.

Vertical keel: Completed.

Stem: Completed.

Stern post: Completed.

Stern frame: Completed.

Rudder: Completed.

Transverse frames: Completed.

Framing of superstructure: Completed.

Flat keelson plates: Completed.

Longitudinals: Completed.

Outside plating: Completed below main deck; above main deck a few plates aft and amidship are in place, about three-fourths of plates are laid off and ready to be fitted.

Inner bottom: Completed.

Superstructure deck beams: Completed.

Main-deck beams: Completed.

Berth deck beams: Completed.

Protective deck-beams: Completed.

Platform-beams: Completed.

Bridge beams: Completed.

Skid beams for boats: Completed.
Coal bunker and other fore.and-aft bulkheads: Completed.
Deck plating: Completed.
Traverse water-tight bulkheads: Completed.
Gutters on decks: Completed.
Stanchions between decks, etc.: Completed.
Engines, boilers and shaft bearers: Completed.
Holes in bulkheads for engineer's pipe: Completed, except holes for pipes to steam-turning gear of turrets.
Shaft tubes and struts: Completed.
Water-tight doors: Completed.
Armored barbette and framing: One plate received.
Armored barbette, backing plates and bolting: Nothing done.
Armored tubes to barbettes: Holes enlarged; angles being fitted.
Vertical armor to 5-inch guns: Armor for 9 guns received, 8 being fitted.
Vertical armor to 6-pounder guns: Armor all in place; sponsons almost completed.
Conning tower, shield, tube and foundation: Tube and foundation completed; armor for conning tower and shield not yet received.
Hatch coamings and skylights: Coamings completed; skylights 50 per cent completed.
Cofferdams: Completed.
Bilge keels: Completed.
Ammunition lifts: Completed.
Magazines: Completed.
Shell room: Completed.
Fixed ammunition room: Completed.
Torpedo manipulating room: Decks laid in forward and after room.
Torpedo stowage: Nothing done.
Passing scuttles: Completed in shops; one fitted in place.
Torpedo fittings to hull: All castings made and fitted in shops; forward and after tubes fitted in place; after shutter completed; gear for working shutter almost completed aft.
Entrance ports: Doors out in shops.
Hammock berthing: Completed except wood molding outside and lining inside.
Coal scuttles: Completed.
Coaling chutes: Completed.
Coal chute plugs: Completed.
Portable coaling chutes: Nothing done.
Ash chutes: Completed.
Mast steps: Completed.
Chain lockers: Completed.
Scuppers: Completed.
Pumping and drainage: Almost completed; hand pumps in place.
Plank-sheers or waterways: Completed on superstructure deck, except margin planks forward and aft.
Deck plank: Completed on berth deck; main deck within superstructure completed except margin planks and gun platforms; superstructure deck completed.
Water tanks: Completed.
Trimming tanks: Completed.
Freeing ports: Holes cut; shutters not yet fitted.
Mast partners: Completed.
Refrigerating room: Metal casing completed; cement laid; wood lining almost completed.
Prisons: Nothing done.
Firemen's wash room: Metal bulkheads completed; rings for basins in place.
Lavatory for crew: Inclosure completed, doors hung; troughs fitted with pipes.
Water-closets and urinals for crew: Inclosure completed; pipes for flushing fitted.
Seating for steering arrangements: Completed.
Steering arrangements: Completed except in conning tower and chart house.
Chart house: Work well advanced in shops; inside fitting still to be done.
Air ports: Castings completed and fitted in place except in superstructure.
Deck lights: Completed in shops; fitted in place as far as located.
Ventilation: Almost completed; Sturtevant fans in place.
Forced draft in fire rooms: Completed.
Masts: Erected on ship, stepped and wedged.
Military and search light tops: Completed except riveting upper inner angles.
Wood floor in coal bunkers: Completed.
Water-courses: Completed.
Ceiling in hold, store room, etc.: Completed.

Sail or awning room: Steel work completed; battens almost fitted, wooden door and shelves to be made.

Ordnance workshop: Nothing done.

Engineer's workshop: Completed except wire bulkhead.

Engineer's log room.

Engineer's storeroom: Completed.

Lamp room: Nothing done.

Oil tanks: Completed.

Windlass bed: Completed.

Windlass: Completed.

Capstan: Nothing done.

Deck pipes: Completed.

Hawse pipes: Completed.

Cable bitts: Completed.

Bow stoppers: Completed.

Ringbolts in deck: Completed in shops.

Stern pipes: Completed.

Warping or towing bitts: Completed.

Warping chocks: Completed.

Bow chocks: Completed.

Steel wire cable nippers: Completed except securing in place.

Anchor davits: Completed.

Billboards: Completed.

Boat davits and cradles: Completed in shops; and other boat davits being fitted.

Wardroom, junior and warrant officer's quarters: Joiner work well advanced in shops.

Cabins, state and other rooms on main deck: Joiner work about one-fourth completed in shops.

Lavatories for officers: Laid off; stanchions for bulkheads secured.

Water-closets and urinals for officers: Laid off, stanchions for bulkheads secured.

Admiral's office: Laid off.

Captain's office: Laid off.

Executive officer's office: Laid off.

Navigator's office: Laid off.

Paymaster's office: Nothing done.

Surgeon's examining room and sick bay: Laid off, lining being fitted, work in shops almost completed.

Dispensary: Laid off.

Pantries: Laid off.

Armory: Laid off, and work on bulkheads started in shops.

Galley inclosure, bed, etc.: Inclosure completed; galley fittings not yet located, wire panels to be fitted.

Band room: Laid off; bulkheads started in shop.

General and other storerooms: Almost completed.

Manhole scuttles: Completed.

Sounding tubes: Almost completed; one being shifted to clear electric switch.

Armor gratings and covers to openings in protective deck: Completed.

Gratings and hatch covers: All made and fitted, except for main deck.

Canopies to hatches: Work well advanced in shops.

Additional support for turrets: Vertical brackets and ring under deck made but not yet in place.

Ladders to hatchways, etc.: Well advanced; no vertical ladders yet made.

Iron rounds or ladders: Almost completed.

Lumber irons: Nothing done.

Ladder (side) sea steps, etc.: Iron work completed in shops; forward sets completed on ship.

Guard rails and stanchions: Completed.

Portable furniture: Work well advanced.

Cooperage: One hundred deck buckets made; other work under way.

Mess lockers for crew: Nothing done.

Jack rods for men's bags: Nothing done.

Swinging tables and benches for crew: Well advanced in shops.

Reels: Nothing done.

Hatch cranes: Nothing done.

Chronometer and compass locker: Nothing done.

Master-at-arms' locker: Nothing done.

Signal lockers: Nothing done.

Hammock hooks: Completed in shops.

Watch bell: Completed in shops.

Awning stanchions: Completed, except a few not yet located.

Eyebolts in beams: Almost completed.
Mooring staples: Completed.
Installation of electric lights: Work advancing, dynamos and engines on board.
Attachments for rigging, chain plates, bolts, etc: Completed in shops.
Platforms for guns: Completed on berth deck and hammock rail.
Lashing bolts and shackles for securing guns, etc.: Nothing done.
Chocks and fair leaders: Completed.
Pin rails: Nothing done.
Brass rubbing plates, etc: Nothing done.
Brass label plates: Completed.
Jacob's ladders: Nothing done.
Running lights: Nothing done.
Life buoys: Almost completed on both sides, attaching gear being fitted.
Swinging booms: Ironwork completed in shops.
Boats: Nothing done.
Chests, benches, and miscellaneous outfit: Nothing done.
Ensign staffs: Completed in shops.
Head and stern ornaments: Nothing done.
Cleaning and painting steel or ironwork: All metal work is being kept painted.
Cement: Almost completed.
Painting, graining, and polishing woodwork: Work advancing.
Testing water-tight compartments, tanks, etc.: Almost completed; 4 cofferdam compartments to be tested.

In my opinion, this vessel is 81 per cent completed, on the basis that 100 per cent completion represents her condition when ready for sea in all respects in all matters coming under the cognizance of the Bureau of Construction and Repair.

If no undue delay in the delivery of the turret armor occurs this vessel will, in my opinion, be ready for her contractor's trial about December 1, 1893, and for delivery to the Government about January 1, 1894.

Very respectfully, your obedient servant.

A. W. Stahl,
Naval Constructor, U. S. Navy, Superintending Constructor.

Chief Constructor T. D. Wilson, U. S. Navy,
Chief of the Bureau of Construction and Repair,
Navy Department, Washington, D. C.

Office of Superintending Constructor U. S. Navy,
Bath Iron Works,
Bath, Me., July 8, 1893.

Sir: In compliance with the Bureau's letter No. 7400–93 dated June 6, 1893, relative to a report of the condition of the vessels building under my supervision at these works, giving as near as practiable headings of specifications, I respectfully submit the following as the condition of the harbor-defense ram No. 1, *Katahdin*.

Items of specifications not mentioned have been completed and already reported.

Skid beams: Material in the contractors' yard; nothing done.
Deck stanchions: Material in contractors' yard; nothing done.
Hatch coamings: Material in contractors' yard; nothing done.
Coal bunkers and other fore and aft bulkheads; partly completed.
Coal-bunker fire alarms: Nothing done.
Shaft alley: Partly completed.
Boat cradles and rest: Nothing done.
Galley inclosure: Partly completed.
Water tanks: Partly completed.
Oil tanks: Material in contractors' yard; nothing done.
Trimming tanks: Completed.
Testing water-tight compartments: Not tested.
Testing tanks: Partly tested.

Armor:

Side armor, deck armor, backing plates, conning tower, armored smoke pipe, armored ventilators, special work connected with armor: Plans and molds made.

All the above plans have been sent to the Bureau, and molds to the armor contractors.

Forgings:

Boat davits: Material in contractors' yard; nothing done.
Mooring staples: Temporarily on ship.
Hatch cranes: Material in contractors' yard; nothing done.

Awning and life-line stanchions: Material in contractors' yard; nothing done.
Lumber irons: Material in contractors' yard; nothing done.
Eyebolts in beams: Material in contractor's yard; nothing done.
Ringbolts: Material in contractor's yard; nothing done.
Grab rods: Material in contractors' yard; nothing done.
Hammock hooks: nothing done.
Clamps and handles: Partly completed.
Socket levers: Partly completed.
Rungs and ladders: Partly completed.
Bands and fittings: Nothing done.
Arm and braces (for hanging ship's bell): Nothing done.
Guards for life buoys: Nothing done.
Stanchions for running light boxes: Nothing done.
Steering engine (on board): Partly completed.
Steering gear: Partly completed.

Castings:

Ship's bell: Nothing done.
Sluice valves: Completed.
Deck plates (cast) waiting for deck armor.
Warping or towing bitts (made): Not in ship.
Warping chocks (made): Not in ship.
Coal scuttles (waiting armor): Nothing done.
Sea steps: Nothing done.
Hawse pipes: In contractors' yard (waiting armor): nothing done.

Joiner work:

Fore and aft bulkheads to staterooms: Material in contractors' yard; nothing done.
Wood casing to steel water-tight bulkheads: Material out; ready to be erected.
Doors to staterooms and athwartship bulkheads: Material worked ready to be erected.
Metal doors: Completed.
Bulkheads between staterooms: Material worked; ready to be erected.
Berths and fittings in staterooms: Material in yard; not worked.
All paneling to under side of decks in wardroom and staterooms: Material in yard; nothing done.
Miscellaneous fittings: Nothing done.
Chronometer and compass lockers or chests: Material in contractors' yard; nothing done.
Lamp room: Material in contractors' yard; nothing done.
Storeroom: Material in contractors' yard; nothing done.
Engineers' log room: Material in contractors' yard; nothing done.
Pantries: Material out; ready to be erected.
Ammunition rooms: Material out; ready to be erected.
Mess table and benches: Material out; ready to be erected.
Deck cleats: Material in contractors' yard; nothing done.
Reels: Material in contractors' yard; nothing done.
Ladder for companionway: Material in contractors' yard; nothing done.
Musket racks: Material in contractors' yard; nothing done.

Carpenters' work:

Berth deck (forward): Completed.
Berth deck (aft): Material in contractors' yard; nothing done.
Swinging booms: Material in contractors' yard; nothing done.
Signal and ensign staffs: Material in contractors' yard; nothing done.
Shoveling flats: Material in contractors' yard; nothing done.
Gratings: Material in contractors' yard; nothing done.
Ceiling in hold: Material in contractors' yard; nothing done.
Wood backing: Completed.

Plumbers' work:

Water-closets: Nothing done.
Bath tubs: Nothing done.

Sundry fittings:

Sluice valves, pipes, etc.: Partly completed.
Water-tight doors: Partly completed.
Holes in B. H. for engineers' pipes: Partly completed.
Clothes and mess lockers for crew: Nothing done.
Deck lights (waiting for armor): Nothing done.
Life buoys: Nothing done.
Fittings for running lights: Nothing done.
Label plates: Nothing done.
Electric call bells: Nothing done.
Speaking tubes and telegraph: Nothing done.

Shaft indicators: Nothing done.
Sounding tubes: Partly completed.
Steam windlass: Partly completed.
Figures for draft of water (painted on ship).
Ventilation: Partly completed.
Fresh-air supply to coal bunkers: Partly completed.
Drainage and pumping arrangements: Partly completed.
Flooding water-bottom: Partly completed.
Water alarms: Nothing done.
Cleaning ship: Attended to.

Calking:
Berth deck (forward): Completed.
After-berth deck: Nothing done.

Electric lighting:
Engines: Nothing done.
Dynamos: Nothing done.
Conductors: Nothing done.
Incandescent lamps: Nothing done.
Search lights: Nothing done.
Insulators: Nothing done.
Fixtures: Nothing done.
Steam piping: Nothing done:
Dynamo and electric storerooms: Nothing done.
Painting: Outside, two coats of red lead; inside, two coats of red lead; bottom, three coats of red lead; living spaces, three coats of red lead.
Cement: Partly completed.
Portable furniture: Nothing done.
Cooperage: Nothing done.
Miscellaneous outfit: Nothing done.
Boats (at sub contractor's yard): Completed.
Fourteen-twentieths of ship completed.

The contractors' trial will depend upon the early delivery of the armor. The contractors state that if the armor is delivered regularly the ship can be made ready for its (contractors') trial in six months after its receipt, and final delivery in three months thereafter.

Photographs and negatives forwarded per express.

Very respectfully,

JOHN B. HOOVER, U. S. Navy,
Superintending Constructor.

CHIEF OF BUREAU OF CONSTRUCTION AND REPAIR,
Navy Department, Washington, D. C.

OFFICE OF SUPERINTENDING CONSTRUCTOR U. S. NAVY,
BATH IRON WORKS,
Bath, Me., July 8, 1893.

SIR: In compliance with the Bureau's letter No. 7400, '93, dated June 6, 1893, relative to a report of the condition of the vessels building under my supervision at these works, giving as near as practicable headings of specifications, I respectfully submit the following as the condition of gunboat No. 6, *Castine*. Items of specifications not mentioned have been completed and heretofore reported.

Sponsons: Nearly completed.
Hammock berthing: Nearly completed.
Galley-house bed: Nothing done.
Galley house: Partly completed.
Cofferdams and passages: Partly completed.
Ash chutes: Completed.
Scuppers: Completed.
Magazines: Nearly completed.
Shell rooms: Nearly completed.
Fixed-ammunition rooms: Nearly completed.
Torpedo stowage: Nearly completed.
Workshop: Nearly completed.
Firemen's washroom: Nearly completed.
Engineers' storeroom: Nearly completed.
Ceiling in hold and storerooms: Nearly completed.
Sail room: Nearly completed.
General stores: Nearly completed.

Drainage and pumping arrangements: Nearly completed.
Wood flooring in coal bunkers: Completed.
Sounding tubes: Completed.
Sluice valves, pipes, etc.: Completed.
Ventilation: Nearly completed.
Air ports: Completed.
Deck lights: Completed.
Deck pipes: Completed.
Ringbolts in deck: Nearly completed.
Eyebolts in beams: Nearly completed.
Boat davits: Nearly completed.
Boat cradles: Nearly completed.
Hatch cranes: Completed.

Joiner work:
Accommodation ladders: Made; not fitted.
Ladders to hatchways: Made; not fitted.
Steering arrangements: Completed.
Chronometer and compass lockers: Made; not in ship.
Wardroom: Nearly completed.
Junior officers' quarters: Nearly completed.
Cabin under poop: Nearly completed.
Pantries: Nearly completed.
Refrigerators: Nearly completed.
Paymaster's office: Nearly completed.
Dispensary: Nearly completed.
Water-closets: Nearly completed.
Lavatories for officers and crew: Nearly completed.
Electric lighting: Nearly completed.
Speaking tubes and mechanical telegraph: Nearly completed.
Running light boxes: Made; not in ship.
Oil tanks: Made; not in ship.
Armory (around mainmast): Change proposed.
Master-at-arms' locker: Made; not in ship.
Musket rack: Nothing done.
Lumber irons: Nothing done.
Hammock hooks: Completed.
Mess and clothes lockers: Completed.
Swinging tables and benches for crew: Made; not in ship.
Signal lockers: Nothing done.
Reels: In ship, completed.
Bridge: Nearly completed.
Water bell: Nearly completed.
Awning stanchions: Nearly completed.
Attachments for rigging: Nearly completed.
Chocks for fair leaders: Nearly completed.
Pin rails (cast): Not in ship.
Life buoys: Completed.
Ensign staffs: Nothing done.
Calking: Partly completed.
Painting throughout ship: Partly completed.

Contractors state will be ready for contractors' trial about August; final delivery to the Government in September, 1893.

Ninety per cent of ship completed.

Very respectfully,

JOHN B. HOOVER, U. S. Navy,
Superintending Constructor.

CHIEF OF BUREAU OF CONSTRUCTION AND REPAIR,
Navy Department, Washington, D. C.

OFFICE OF SUPERINTENDING CONSTRUCTOR, U. S. NAVY,
BATH IRON WORKS,
Bath, Me., July 8, 1893.

SIR: In compliance with the Bureau's letter, No. 7400, '93, dated June 6, 1893, relative to a report of the condition of the vessels building under my supervision at these works, giving as near as practicable headings of specifications, I respectfully submit the following as the condition of gunboat No. 5, *Machias.*

Machias completed, as per contract, with the exception of the following items: Painting throughout ship, putting in linoleum, leathering boat fenders, squaring decks, putting eyebolts in skid beams, putting up musket racks, putting up shot racks, torpedo heads to stow, deck pipes to mark, oil tanks to mark.

Official trial June 10, 1893.

Delivered to commandant navy-yard, Portsmouth, N. H., July 1, 1893.

Photographs and negatives forwarded per express.

Very respectfully,

JOHN B. HOOVER, U. S. Navy,
Superintending Constructor.

CHIEF OF BUREAU OF CONSTRUCTION AND REPAIR,
Navy Department, Washington, D. C.

OFFICE OF SUPERINTENDING CONSTRUCTOR,
QUINTARD IRON WORKS,
New York, July 6, 1893.

SIR: In compliance with the Bureau's letter, No. 7400, '93, of the 6th ultimo, directing that photographic views be taken and that a special report be made and forwarded, giving in detail the work on the *Marblehead* July 1, 1893, following, as far as practicable, the items given by headings of paragraphs in the specifications, I have the honor to submit the following report:

Vertical keel: Completed.
Flat keel: Completed.
Stem: Completed.
Sternpost: Completed.
Stern frame: Completed.
Rudder: Completed.
Transverse frames: Completed.
Deck beams: Completed.
Skid beams for boats: Completed.
Water courses: Completed.
Longitudinals: Completed.
Flat keelson plates: Completed.
Outside plating: Completed.
Center-line bulkhead: Completed.
Transverse water-tight bulkheads: Completed.
Coal bunker and other fore-and-aft bulkheads: Completed
Passage in coal bunker: Completed.
Water-tight deck: Completed.
Girders to water-tight deck: Completed.
Bilge keels: Completed.
Shaft tubes and struts: Completed.
Water-tight doors: Completed, except where changes are being made.
Engine, boiler, and shaft bearings: Completed.
Gun-deck stringers and plating: Completed.
Berth-deck stringers and plating: Completed.
Breast hook: Completed.
Platforms: Completed.
Stanchions: Completed.
Gutters on gun deck: Completed.
Plank shears or waterways: Completed.
Deck planking on poop, gun, and berth decks: Completed, except where taken up to make authorized changes.
Hammock berthing: Completed.
Freeing ports: Completed.
Portable coaling chutes: Completed, except a few to be made to fit to under side of water-tight deck.
Machine gun and torpedo port shutters: Torpedo port shutters completed; machine gun port shutters require some minor fittings to complete.
Torpedo arrangements: Completed.
Sponsons for guns: Completed.
Platforms for guns: Completed.
Gun supports: Completed.
Mast partners: Completed.
Windlass bed: Completed.
Mast steps: Completed.
Hammock hooks: Completed except in two after crew-spaces.

Hatch coamings and skylights: Completed except where changes are being made in location of poop deck hatches.

Bridges: Completed except fitting compass on forward bridge and speaking-tube to chart house.

Gratings and hatch covers: Wooden gratings and hatch covers completed. Armor gratings about one-half completed.

Air ports: Completed except where changes have been authorized in new arrangement of quarters on gun deck.

Ladders (side) sea steps, etc: Completed except leadman's stool and sentry walk.

Awning stanchions: Completed.

Guard rail and stanchions: Stanchions completed. Rail and wire rope nearly completed.

Canopies: Completed.

Iron rounds, or ladders: Completed except from gun deck to fire room, and on hammock berthing in wake of gun sponsons.

Ladders to hatchways, etc: Completed except one or two slight changes to be made.

Hatch cranes: Completed.

Shot racks and musket racks: Made but not fitted.

Attachments for rigging, chain plates, bolts, etc: Completed.

Lashing bolts and shackles for securing guns: In place for 6-inch guns only.

Chocks for fair leaders: Completed.

Pin rails: Made and in place. Pins not fitted.

Lumber irons: None fitted.

Life-buoy guards: Completed except changes in port guard, owing to changes in quarters.

Brass rubbing plates, etc.: Completed.

Jacob's ladders: Completed.

Running lights: Nothing done.

Swinging booms: Completed.

Ensign staff: Completed.

Deck lights: Completed.

Watch bell: Completed.

Boat davits and cradles: Davits completed except those for steam launch, sailing launch, and wherry. Cradles made but not fitted to boats or secured in place.

Galley house, bed, etc.: Completed.

Cofferdams: Completed except fitting a few covers.

Bow stoppers: Completed.

Hawse pipes: Completed.

Windlass and capstan: Completed except head of capstan, which has not been received.

Deck pipes: Completed.

Manger: Completed.

Warping pipes: Completed.

Warping or towing bitts: Completed.

Steel-wire cable nippers: Completed.

Ring bolts in deck: Completed.

Anchor davits: Completed.

Bill boards: Completed except upper plates.

Conning tower and shield for entrance to same: Completed except the lifting arrangement for hood, which is nearly completed.

Wood pilot house: Completed except seat.

Steering apparatus: Completed.

Chain lockers: Completed.

Water tanks: Completed except fitting forward upper-trimming tank for fresh water.

Ash chutes: Completed.

Coal scuttles: Completed.

Trunks to coal bunkers: Completed except a few minor items.

Wood floors in coal bunkers and passages: Completed except pine flooring to be worked under coal chutes.

Magazines: Completed except slight alterations to be made in drains and flood pipes, and the change in stowage made necessary by change in dimensions of ammunition.

Shell rooms: Completed except slight alterations to be made in drains and flood pipes.

Fixed-ammunition room: Completed except slight alterations to be made in drains and flood pipes.

Torpedo stowage: Lockers completed for stowing torpedo heads. Nothing fitted for stowing torpedo bodies.

Passing scuttles: Completed.

Drainage and pumping arrangement, ventilation: Completed except changes made necessary by authorized changes in quarters.
Trimming tanks: Completed.
Sluice valves, pipes, etc.: Completed.
Sounding tubes: Completed.
Ceiling in hold, storerooms, etc.: Completed.
Officers' water-closets, wardroom, junior officers' quarters, cabins under poop deck, paymaster's office, armory, signal lockers, dispensary, pantries, painting, graining, and polishing wood work: The changes authorized in these quarters are only fairly started and will require about four months to complete.
Chronometer and compass locker: Nothing done.
Sail room: Completed except rollers.
General storerooms: Completed.
Prisons: Completed.
Master-at-arms' locker: Nothing done.
Swinging tables and benches for crew: Completed.
Engineers' workshop, storerooms, and log room, ordnance workshop: Completed except a few small fittings.
Refrigerating room: Completed.
Crew's water-closets: Completed.
Firemen's wash room: Completed.
Lavatories for officers and crew: Completed.
Reels: Completed.
Brass label plates: Made but only partly fitted for all except water-tight compartments, for which the plates are not yet made.
Mess and clothes lockers for crew: Mess lockers completed; clothes lockers completed except for petty officers.
Eyebolts in beams: Completed.
Lamp room: Completed.
Oil tanks: Completed.
Cleaning, galvanizing, etc., and painting steel or iron work: Considerable painting and cleaning remains to be done throughout the ship.
Calking: Complete except in a few places.
Varnishing decks: Nothing done.
Figures for draft of water: Completed.
Cement: Completed.
Scuppers: Completed.
Coal-bunker fire alarm: Circuit being run; work well advanced.
Water alarms: Circuit being run; work well advanced.
Means of interior communication: Speaking tubes, etc., being run.
Installation of electric lights: Dynamos, room and foundation nearly completed, including placing of dynamos and engines; much of the molding run, wires led, and some fixtures in place.

I estimate the degree of completion under the contract and including all authorized changes to be 85 per cent, and I consider that this vessel should be ready for the contractor's trial by November 1, 1893, and for final delivery to the Government by November 15, 1893.

Very respectfully,

G. H. ROCK,
Assistant Naval Constructor U. S. Navy,
Superintending Constructor, Marblehead.

CHIEF OF BUREAU OF CONSTRUCTION AND REPAIR,
Navy Department, Washington, D. C.

OFFICE OF SUPERINTENDING CONSTRUCTOR, U. S. NAVY,
COLUMBIAN IRON WORKS AND DRY DOCK COMPANY,
Baltimore, Md., July 3, 1893.

SIR: In accordance with Bureau's orders of the 6th ultimo, No. 7400, I submit the following report upon the condition of Cruiser No. 10 (*Detroit*) at date of July 1, 1893.

The hull of this vessel, including the standing rigging, may practically said to be done, barring the several items of work below enumerated, which are in hand.

Change in quarters, authorized by Bureau May 9, 1893: This item of work is well under way, and should be completed by the 15th instant.
Boat chocks: Work in hand should be finished by the 15th instant.

I have no official information of the leaving of the vessel for the Norfolk navy-yard, but believe she will be ready to go on or about the 15th instant. The photographs and negatives ordered accompany this report.

Respectfully, your obedient servant,

WM. H. VARNEY, U. S. Navy,
Superintending Constructor Cruisers Nos. 9 and 10.

CHIEF CONSTRUCTOR, U. S. NAVY.
Navy Department, Washington, D. C.

OFFICE OF SUPERINTENDING CONSTRUCTOR, U. S. NAVY,
COLUMBIAN IRON WORKS AND DRY DOCK COMPANY,
Baltimore, Md., July 21, 1893.

SIR: In accordance with the Bureau's orders of the 6th ultimo, No. 7400, relative to the condition of Cruiser No. 9 (*Montgomery*) July 1, 1893, I submit the following:

The work on the hull of this vessel under the original contract has advanced almost to completion, and the items of work herein enumerated as unfinished are mostly well under way; the same will apply to the authorized changes, which latter are indicated with a X mark.

Piping in forward trimming tank: Not completed.
No louver in ventilating duct in sail room.
Drains on platforms: Not completed.
Sea-cock rods: Not completed.
Eaves to water-tight deck: To clean and paint.
A number of holes in bulkheads platforms, water-tight deck, to close.
Covers to manifold rods: Not secured
Doors in center-line bulkhead: Not completed.
Guard rail to steering engine and cover over gears: Not completed.
Rod to sea cock to fill trimming tank: Not on.
Drains in tiller-room: Not completed.
Piping to after-trimming tank: Not completed.
A number of stops to water-tight doors: Not completed.
Joiners work: To complete.
Junior officers' bathroom: To complete.
Ventilation: To complete.
Fire main: To complete.
Hammock numbers: To put up.
Air-port lanyards: To complete.
Grab rods: To complete.
Bag racks: To complete.
Mess tables: To stow.
Lockers: To put up.
Hand rail in gun supports: To put in.
Catches to deck lights: To put in.
Firemen's wash room: To complete.
Ice machine: To complete.
Eyebolts for hoisting guns: To complete.
Machine-gun mounts on hammock berthing: To secure.
Boat chocks and gripes: To complete.
Holes in metalic port shutters: To cut.
Pump stanchions.
Gangway treads: To complete.
Side ladders: To complete.
Leadsman's stand: To complete.
Coal scuttles: To complete.
Pin rails: To complete.
Flying bridge rail: To complete.
Awning stanchions on pilot house: To complete.
Leader pipes on after end of forecastle: To complete.
Galley pipe: To complete.
Gun racks: To complete.
Bucket hooks: To complete.
Marines' boxes: To complete.
Bilges: To clean.
Painting.
Planing decks.
Drilling for wood screws to secure wood gasket in port shutters.
Cork paint in living spaces to be painted and glossed.

Chain fender, or hook under small sponson for fender.
Speaking funnel in top of pilot house.
Ammunition trolleys in passing rooms.
Suctions in crank pits must not be less than 3 inches.
Shot racks: To complete.
Racks for log and storerooms.
Eyebolts in beams.
Running lights: To complete.
Oil tanks: To complete.
Voice tubes: To complete.
Electric call bells: To complete.
Canopies: To complete.
Rubber bumpers in air ports: To complete.
Signal lockers: To complete.
Armory: To complete.

The change in officers' quarters is reported under the head of joiners' work; this item of work is well under way.

The above comprises the list of unfinished work, and much of it is practically finished; of course there are small and trifling items discovered from day to day which require change or repair, but of no material importance.

I would place the percentage of work completed under the contract to be about 97 per cent.

In case the work on the ship is pushed forward with dispatch, I think she will be ready for her official trial by the 1st day of September next.

Should her first trial prove successful, and the work be then conducted with dispatch, the vessel should be ready to turn over to the Government not later than November 1, 1893.

Photographs, as directed by the Bureau, accompany this report.

Respectfully, your obedient servant,

WM. H. VARNEY, U. S. Navy,
Superintending Constructor Cruiser No. 9, Montgomery.

OFFICE OF SUPERINTENDING CONSTRUCTOR FOR U. S. NAVY,
IOWA IRON WORKS,
Dubuque, Iowa, July 1, 1893.

SIR: In obedience to the Bureau's order in letter No. 7400, '93, dated June 6, 1893, I have the honor to submit the following report of the condition of the work on the U. S. torpedo boat *Ericsson* on July 1, 1893:

Material: Practically all material on hand for the construction of the hull, such as plates, shapes, rivets, coppers, etc.
Drawings: The contractors have prepared nearly all drawings necessary for the construction of the hull. Very satisfactory progress made in this office on the detail plans taken from work.
Workmanship: So far the workmanship is quite satisfactory.
Weighing material: The weights are being taken with great care and with as much accuracy as possible under the circumstances.
Flat keel plates: In place and riveted up.
Vertical keel: Finished and in place; completely riveted up.
Stem: Finished and in place.
Sternpost: Finished and in place.
Stuffing box and rudder bearer: In place and nearly completed.
Rudder: In place complete.
Shaft tubes: Riveted up in place, nearly completed.
Shaft struts: In place and partially riveted up.
Transverse frames: Practically completed.
Flat keelson plate: Completed
Deck beams: In place and practically completed.
Deck plating, stringers, etc.: Completed and in place, partially riveted up.
Turtle-back deck: Nearly completed and riveted up.
Outside plating: Completed practically but no openings have yet been cut. Wood moldings about 75 per cent completed on sheer line.
Fore-and-aft bulkheads: Nearly completed.
Transverse water-tight bulkheads: Nearly completed.
Stanchions: One stanchion worked in abaft rudder post.
Guard rails and stanchions: Fittings are being cast of composition.
Awning stanchions: Fittings are being cast of composition.

Hatch coamings and skylights: Well advanced towards completion.
Engine foundations: Practically completed.
Boiler bearers: Commenced.
Shaft bearers: Nearly completed.
Water-tight doors: Well advanced towards completion.
Conning tower: Standing part completed; fittings and cover ready to be put together.
Coaling scuttles: Nearly completed.
Fixed-ammunition room: Nearly completed.
Holes in bulkheads: None cut.
Mast step: Cast.
Woodwork in cabins, etc.: Plans have been prepared, but no other work done.
Ventilation: Plans of ventilators are being prepared; goose-neck ventilators nearly completed.
Steering apparatus: Steering engine has been run by steam; racks have been completed and the work is well advanced; the cast-steel quadrant is in place on the rudder stock.
Drainage and pumping: Work well advanced.
Watercourses: Nearly all cut.
Water-closet for officers: Nearly completed; water-closet bowl ready to be fitted in place; other fittings not yet made.
Water-closet for crew: Nearly completed; water-closet bowls on hand and ready to be fitted in place.
Crew's space and machinists' quarters: Nothing done excepting platform angles secured in place.
Propeller guards: Plan prepared, nothing else done.
Anchor beds: Nothing done.
Water tanks in galley: Completed.
Sea steps: Plan prepared, nothing else done.
Galley: Plan prepared, nothing else done.
Platform for guns: Plans being prepared, nothing else done.
Portable furniture: Plans prepared, nothing else done.
Iron ladders: Material on hand, nothing done.
Wire cable fittings: Plans prepared and castings made for chocks.
Hatch crane: Practically completed (and has been so for some time).
Hatch ladders: Plans are being prepared.
Deck lights, etc.: Partially completed, but not fitted in place.
Side ladders: Plans prepared and a few castings made.
Boat davit and torpedo crane: Plans partially prepared and castings made.
Boats: Two folding boats ordered.
Anchor davits: Nothing done.
Watch bell: Nothing done.
Reels: Partially completed.
Warping cleats: Plan prepared.
Cooperage: Nothing done.
Oil tanks: Plan prepared.
Electric-light plant: Not yet delivered.
Voice pipes, etc.: Nothing done.
Ensign staff socket: Cast.
Water-tight compartments: Not yet tested.
Bow torpedo-tube casting: Completed and in place; cover not yet cast.

I estimate that about 79 per cent of the work has been completed under the contract, and that the *Ericsson* will be ready for the contractors' trial at sea about July 1, 1894, and for final delivery to the Government, about August 1, 1894.

Very respectfully, your obedient servant.

LLOYD BANKSON,
Assistant Naval Constructor, U. S. Navy,
Superintending Constructor

CHIEF OF BUREAU OF CONSTRUCTION AND REPAIR,
Navy Department, Washington, D. C.

APPENDIX H.

REPORTS FROM NAVAL CONSTRUCTORS RELATIVE TO IMPROVEMENTS IN SHIPBUILDING PLANTS AT NAVY YARDS.

OFFICE OF NAVAL CONSTRUCTOR,
Navy Yard, New York, July 12, 1893.

SIR: (1) Referring to bureau's letter of 6th instant, 7402–93, I have the honor to make the following report and recommendations for the improvement of the construction plant of this yard which is much the same as that of August 31, 1892.

(2) In addition to the lack of certain machine tools and appliances, the chief causes that tend to reduce the efficiency and to increase the cost of working is the scattered location of shops, docks, and slips, and the unsuitability of many of the buildings for the purposes to which they are assigned. The scattered location causes loss, in transit of workmen, carrying to and fro molds and templates in fitting work, the increased difficulty of proper supervision, the great loss of transporting material, particularly to ships lying beyond the dry docks, and on account of the greater number of power stations required. During the past year this department has had in constant operation from seven to nine steam plants requiring separate sets of firemen and engineers and resulting in great loss from unfavorable conditions under which these small engines work.

(3) At present it is always necessary to keep one and often two of the ships under construction on the farther side of the wooden dry dock, thus entailing great expense in the transit of workmen, the transportation of material, and the frequent interruption of electric light and power due to the removal of the wires for docking ships. Sufficient wharfage room should be provided to give each ship under construction a berth convenient to the shops.

(4) The bending shed is a frame structure in bad condition, and is in constant danger from fire. The furnaces are too small. A new shed and furnaces are required before important new work should be taken in hand.

(5) I wish to call particular attention to my recommendation of last year with regard to the annoyance and delay resulting from the lack of suitable offices and drafting rooms. They are temporarily located in building No. 10. This building has been for years used for the stowage of oil in bulk. It is in a bad sanitary condition, complaint being constantly made of violent headaches due to remaining a few hours at one's desk when the weather or other circumstances require the offices to be closed. The great amount of smoke and soot from the smith shop opposite, that comes in at open windows is a great detriment to the work and very annoying. The space available is entirely too small; a temporary inclosure had to be built to accommodate a sufficient number of draftsman, and it is necessary to crowd clerks into poorly lighted and poorly ventilated rooms.

(6) The joiner shop, on account of the unsafe condition of building No. 6, had to be moved into building No. 14, leaving but a small portion available as a mold loft.

(7) Considerable improvement has already been made in various departments, including a boat-storage room, a new pattern shop in building No. 12, etc., but to secure a good, efficient, and economical plant it is necessary that a fixed and comprehensive scheme should be followed. I earnestly recommend that some such scheme be adopted so that, except in cases of emergency or slight running repairs, the money for improvement of the plant can be expended in accordance with the approved plans.

(8) The following rearrangement of the plant, as shown by the chart which accompanied report of last year, is proposed. I recommend that its approval be urged, Part I to be carried into effect as soon as possible; Part II before any extensive new work is undertaken, and Part III from year to year as found necessary for the work directed to be done at this yard.

PART I.

(1) That, as previously recommended, building No. 6, the old joiner shop, should be rebuilt, and assigned to this department, the first and second stories for officers, storage, and drafting rooms, as shown on submitted plan with last year's report. A third story should be erected when rebuilding. It would make the temperature more uniform and afford ample dry-storage room, such as was not available in this department when the Bureau ordered the cellulose for the new ships to be stored at this yard. No ceiling need to be fitted to the roof. This plan provides an ample number of offices and a commodious drafting room, conveniently located and free from dirt and soot of the shipsmith's shop.

(2) That a central power station be established in building No. 10. New pumps having been proposed for the stone dry dock, the present pump room will accommodate the new pumps, the engine now in the punch shed, and the electric and hydraulic plants. The present boiler room should be fitted with new boilers and should have a ventilation shaft constructed over it, to take off the heat that otherwise spreads through the whole building. By means of shafting, wire rope, and pneumatic transmission, this plant would furnish power to the punch shed, iron-plating shops, smith shop, paint shop, foundry, plumbing, joiner, pattern and block shop, thus reducing the power stations to two, the other being at the sawmill, where wood can be used to great extent. The sawmill requires a new engine and boilers, requisitions for which have been submitted.

(3) The compartment next to boiler room on lower floor of building No. 10 should be used as a central tool house. The rest of the building should then be used as a joiner, cabinet-makers' and block shop. In that case the upper floor of building No. 14, temporarily in use as a joiner shop, would be restored as a mold loft and the lower floor would be used for stores.

(4) The removal of the engines, boilers, and testing room from the punch shed would allow a complete rearrangement of the machinery and plate racks there.

(5) By removing certain ship-fitting tools from the iron-plating shop to the punch shed, sufficient space is acquired in the former for an efficient brass-finishing shop.

(6) A shed is urgently needed for shipwrights, at each dry dock.

PART II.

(7) New smith shops have been proposed for the steam-engineering department. This would leave the portion of No. 11, now used by engineering, available for use as the construction foundry. As this building was formerly used as a foundry and the cupola, brass furnaces, coke oven, and steps for cranes are still in place, it could be readily fitted up. The present foundry should be used as a galvanizing shop.

(8) A new bending shed and flange-turners shop, also an angle smithery, should be erected where shown on chart. This takes up the slip recently occupied by the *Intrepid*, only available for a small vessel, but still leaves three others.

PART III.

(9) A new building should be put on the present site of the wooden building Nos. 115, 117, and 118. It should have a lofty, well-ventilated ground floor, to be used as a punch shed and steel shed, with pickling tanks, etc., and a second story spanning First street, to be used as a mold loft and pattern shop.

(10) An experimental tank should, in my opinion, be constructed at this yard. A site for the same, together with plans and estimates, could be furnished at any time. Forty thousand dollars would probably cover cost of tank and appliances.

I most earnestly recommend that all new buildings should be substantially constructed of brick and iron. Light wooden structures for machine shops furnish very bad support for the heavy shafting required, are soon in bad repair, and are in constant danger from fire.

The scheme proposed above will, as soon as building No. 6 is repaired, provide good officers and draughting rooms, allow the transfer of joiner and block shops, provide a brass-finishing shop, and establish a central-power station. At the end of a few years it will provide a compact and most efficient plant, capable of keeping up all repairs required, and at the same time carrying on such building programme as would probably be assigned to this yard.

To carry into effect Part I of the above-shown scheme the following changes and additions are required. They are now necessary for efficiency and economy in carrying on the new work in hand and to put the plant in a condition to expeditiously and economically make such repairs on the new ships as will probably be demanded of this yard:

ESTIMATED COST READY FOR WORK.

The shipyard.

1.	Portable hoisting engine	$1,200
2.	Five standard-gauge push cars	200
3.	The caissons at each dock should be altered and a track added jointing the yard railway system for transportation of material on push cars or trucks	
4.	Power capstans should be placed around all drydocks	

Plumbing and pipe-fitting shop.

5.	Metal workers' and tinners' tools, folder, groover, burring machine, slip-roll former, tinners' snips, bench shears, bench drill, oval-handle former, cleat former	400

Requisitions for the above plumbers' tools have been submitted.

Machine iron-plating shop and brass-finishing shop.

6.	40-inch planer to plane 10-inch long with chucks, etc	3,200
7.	Screw-slotting machine	150
8.	One 16-inch engine lathe	560
9.	One 8-inch brass finisher's cabinet turret lathe	900
10.	Three upright drill presses	1,500

Joiner shop.

11.	Emery tool grinder (requisition submitted)	80

Blacksmith shop.

12.	350-pound steam hammer, with plain dies	720
13.	4,500-pound steam hammer (requisition submitted)	3,600

Tool room.

14.	Tool-grinding machine	1,400
15.	Grindstone dresser	20

Pattern shop.

16.	Face-plate lathe	400
17.	Three trimmers	100
18.	Handsaw-setting machine	20
19.	Handsaw-filing machine	25
20.	Establishing central-power station in building No. 10	60,000
21.	Repairing building No. 6, for offices, etc	

Part II requires the following changes and additions, all of which should be made before any extensive new work is taken in hand:

22.	One angle furnace	6,000
	Revolving beam forge	200
23.	Hydraulic plate bending and flanging machine	15,000
24.	New forges for angle smith shop	600
25.	Two new countersinks	750
26.	Double angle shears	1,800
27.	Pneumatic sytem for working cranes in shops, capstans at docks, and calking tools on ships, small cranes included	9,000
28.	New bending shed	25,000
29.	New angle smith shop	15,000
30.	New shipwright's shed at each dry dock	8,000

Part III requires, in addition to the above items, the following changes to put the plant in first-class order, capable of carrying on, expeditiously and economically, all repairs that would probably be required by a fleet of modern ships, and at the same time carrying on a building programme of three ships in four years:

31. New building on site of punch shed: First floor to be used as a punch shed, steel and pickling shed; second floor to be for mold loft and pattern shop.

32. Canal and pond for boat shed; repairs to boat shop.
33. I earnestly renew my recommendation of last year that building No. 9 be suitably fitted up and assigned for use of the employés as a lunch-room. A suitable person should be selected whose duty would be to heat the building and keep it in proper state of cleanliness.

In return for these services this attendant should be granted the privilege of selling tea, coffee, and such light food as might be suited to the wants of the men, the price and character of the same to be regulated by the commandant.

The room to be so arranged that men bringing their own lunch shall be equally as comfortable as those who buy.

I recommend this arrangement in the interest of morality, economy, and cleanliness.

The foregoing estimates have been without drawings or specifications and can only be considered as approximate.

Plans and estimates will be furnished when required.

Very respectfully,

F. L. FERNALD,
Naval Constructor, U. S. Navy.

COMMANDANT NAVY-YARD, NEW YORK.

[First indorsement.]

COMMANDANT'S OFFICE,
Navy-Yard, New York, July 14, 1893.

Respectfully referred to the Bureau of Construction and Repair for its information and action.

BANCROFT GHERARDI,
Rear-Admiral U. S. Navy, Commanding Navy-Yard and Station.

JUNE 20, 1893.

SIR: In compliance with the instructions of the letter of the Bureau of Construction and Repair, No. 7402, '93 of the 6th instant, I have the honor to submit the following suggestions for the improvement of the construction plant at this navy-yard and to enable the work of this department to be performed with increased economy and rapidity.

As the work in this department is in many respects dependent upon the general arrangement and facilities of the navy-yard, I have included certain recommendations upon matters not immediately under the direction of the Bureau of Construction and Repair and in addition to the necessities of the shops of this department.

(1) Dry dock No. 1 (stone dock), is limited in capacity to vessels of the size of the *Atlanta* and if lengthened 100 feet could be used for all the cruiser class of vessels which would increase its usefulness to a very large extent.

(2) Dry dock No. 2 is so constructed at the gate that it can not be used for docking the battle ships now building and it will be exceedingly dangerous to attempt the docking of the *Texas* or armored cruisers in this dock when at the load draft. An additional dry dock of sufficient size for these vessels is recommended and the importance and necessity of beginning at the earliest possible moment the construction of such a dock at this navy-yard can not be overestimated. An available and desirable site adjoins dry dock No. 2.

(3) The difficulty of berthing ships at this navy-yard, owing to insufficient wharfage, has been frequently experienced during the past year and the necessity for berthing ships at a considerable distance from the shops has delayed and increased the cost of the work of repairs. It is recommended that the timber basin should be cleared out and converted into a fitting basin by building a wall and gate across the continuation of Rowan avenue, utilizing that portion of the dock to the west for spar timber, the eastern portion to be deepened and provided with retaining walls and a pontoon bridge at the eastern end.

(4) The shipfitter's shop has proved of entirely inadequate capacity for carrying on the work of the department, it is too small for the machines it now contains and the equipment of tools is not more than half what it should be. My recommendation of last year in regard to this matter is, therefore, renewed and urged, especially in view of the fact that the smithery, building No. 9, has continued to develop serious defects, and in order to obtain necessary space for the tinners, the tin shop has been moved to the spar shed, building No. 28.

It is, therefore, suggested that a new shipfitters' shop be erected in the vacant lot adjacent to the timber basin, which shall have wings and galleries and be fitted with traveling cranes, elevators, and all modern appliances, electric plant, new shop engine and boilers, and additional machine tools, and be connected with the railroad system of the yard.

In building No. 42, thus vacated, it is proposed to locate the foundry at the north end, utilizing the present chimney, enlarging the plant with cupolas and cranes, the south end of this building to be rearranged in two stories for plumbers, coppersmiths, tinsmiths, and pipefitters.

Building No. 9, the present smithery, to be torn down and a new one erected having iron framework and corrugated iron sides and roof, and be supplied with a 5,000-pound steam hammer, a new reverberatory furnace, and the jobbing, angle, beam forges to be rearranged.

Estimated cost of changes and installation of tools, rearrangement of shop interiors, and new tools and equipments, $150,000.

(5) When ships in dry dock or in the vicinity are undergoing repairs much time is lost by the workmen in going to and from the shops, which are 2,000 feet distant. It is suggested that a one-story shop, with a shed at each end, be built between the two dry docks and supplied with a small outfit of machinery and a motive engine of 40-horse power, for which steam could be obtained from the pump house. The sheds would provide convenient stowage for docking gear and cover for stage-plank shores, horses, etc., which deteriorates rapidly from exposure. The estimated cost of machinery for this shop and for erecting and installing the plant is $20,000.

(6) A locomotive 10-ton traveling crane and car would greatly reduce the cost in handling the material of this department, $4,300.

A floating self-propelling derrick with revolving jib having a capacity of 80 tons is very necessary, and could be built and maintained by this department to advantage; the facilities now available for handling heavy weights are inadequate to the work of the yard, $75,000.

Summary.

4. Changes and installation of tools, rearrangement of shop interiors, new tools and equipments	$150,000
5. Machinery for new one-story shop to be located between the two dry docks and for erecting and installing plant in same	20,000
6. A locomotive 10-ton travelling crane and car	4,300
6. A floating self-propelling derrick, 80 tons capacity	75,000
	249,300

Very respectfully,

FRANCIS T. BOWLES,
Naval Constructor, U. S. Navy.

Capt. E. E. POTTER, U. S. Navy.
Commandant.

NAVAL CONSTRUCTOR'S OFFICE,
Navy-yard, Mare Island, Cal., July 7, 1893.

SIR: Referring to letter from the Bureau of Construction and Repair, No. 7402, '93, of June 6, 1893, directing a report embodying any suggestions relative to the improvement, alteration, or addition to the construction plant of the yard that will enable work to be performed more economically or more promptly, I beg to report as follows:

Certain additions are now under way as follows, plan No. 1354 showing the locations:

FURNACES AND ACCESSORIES.

The grading for the angle and plate-bending furnaces is completed and the foundations ready to proceed with the erection of the furnaces. Nearly all the material for the furnaces and slabs is contracted for and some of it is delivered. The foundation and cross pieces for supporting the bending slabs are out. Leveling under scrive boards is nearly done. Oil-burning furnaces having been authorized, the completion of this portion of the plant involves the installation of storage tanks and pumping appliances. It is proposed to construct the former from plating taken from the old *Monadnock* turrets.

The estimated cost to complete these essential portions of the plant is as follows:

	Material.	Labor.	Total.
Plate and angle furnaces	$400	$950	$1,350
Oil-storage tanks	310	1,040	1,350
All pumping gear, oil burners, etc	2,800	850	3 650
Making and laying slabs	350	2,080	2,430
Completing platforms for serive boards	375	225	600
Total	4,435	5,145	9,380

HEAVY-BENDING ROLLS.

The foundation for this large tool is completed. The tool is now stored. To erect it, connect piping, etc., placing the tool in complete working order, will require $3,100.

HYDRAULIC KEEL-PLATE BENDER.

The foundation for this tool will probably be completed during this month. The tool itself will be set up in running order by the contractor, but the accumulator to work it, with necessary water tanks, etc., must be erected by the Government. This will cost, it is estimated, $1,800.

GALVANIZING PLANT.

The improvement of the galvanizing plant is essential. A small pot, which has been out of use for sometime, was recently used because it was necessary to do a small amount of galvanizing in connection with repair work on the *Monterey*. The cost of doing this work with crude and improvised appliances was excessive.

Plan No. 1354 shows the proposed location of the galvanizing plant. The estimated cost of a satisfactory outfit is $2,200.

This should be installed at an early date, as there is a good deal of galvanizing to be done upon the *Monadnock* work.

MACHINE SHOP.

The following additional tools are needed in this shop to round out the plant and put it in condition to turn out work more rapidly when handling emergency repair work:

1 portable drill	$275
1 radial drill	1,600
1 shaping machine	1,345
1 set cutters (gear)	181
1 open-side planer	2,100
1 universal grinding machine	700
1 dynamo for plating	125
Total	6,326

The proper installation of the construction plant at this yard has been much delayed and hampered by the lack of certain comparatively cheap buildings.

The fine 250-horse power Corliss engine installed in 1891 has been under a temporary wooden shed ever since. Money became available July 1 to put a suitable house over this engine. It has been proposed by the civil engineer of the yard, at my suggestion, to take advantage of the fact that old cistern walls adjoining the power house gave a good foundation to build a wing to the power house, as shown in plan No. 1354, for the housing of the hydraulic pumps for the accumulator and the oil and air pumps for the furnaces.

This is an exceedingly satisfactory plan, as one man can then attend to these pumps as well as the main engine.

I venture to urge upon the Bureau the importance of securing this improvement.

Money became available July 1 to construct a shed over the furnaces, slabs, etc. It is desirable, if possible, to extend this shed to the smithery wall, as shown in plan No. 1354, in order to house the galvanizing plant.

If the funds available do not allow of this, as much of the shed as possible should be built at once, with a view to its extension when possible. This improvement is under Yards and Docks, and plans are now being prepared by that department with a view to the above.

An open shed for ship-fitters' tools is essential for the economical and rapid prosecution of plating and framing work.

The tools necessary for the completion of the *Monadnock* are temporarily erected in one end of the smithery. This location, the best available, is unsuitable, being out of the way, crowded, and badly lighted.

A large part of the tools bought for the yard have been stored for about two years for lack of room to erect them.

The ship-fitters' machine shed, shown on plan No. 1354, is under the cognizance of Yards and Docks. (Estimated cost is about $20,000.)

Construction work in connection with the installation of ship-fitting plant in it (such as shafting, belting, foundations, etc.), will amount to about $8,500.

In addition the tools indicated by shaded lines in plan No. 1354 should be bought, estimated cost as below:

1 22-foot planer	$5,400
1 double punch	2,400
1 combined punch and shears	2,100
2 jib crane counter sinks, at $450	900
Small tools and miscellaneous	2,500
Total	13,300

POWER TRANSMISSION.

The 250 horse power Corliss engine is large enough to drive the tools in the proposed ship-fitter's shed as well as the tools at the joiner shop and sawmill.

In addition, the hydraulic power from the accumulator to be erected should be made available in all the shops and at the fitting-out wharf by suitable mains.

Owing to the mild climate, hydraulic power is peculiarly suited for use at this yard.

The cost of power transmission from the main engine shafting in machine shop to the other shops mentioned, and from the hydraulic accumulator to the various shops, I estimate at $8,000.

An electric plant for lighting ships under repair and construction work, working electric tools, etc., is now recognized as a necessary and economical adjunct of a construction plant.

I estimate the cost of a suitable plant at $15,000.

The power tools in joiner shop are nearly all old and beginning to wear out. It is desirable now to add the following:

1 jig saw	$100
1 boring and mortising machine	425
1 blind tenon machine	100
1 tenoning machine	300
1 staple machine	40
1 planing machine	1,800
Total	2,765

While not under the cognizance of the Bureau of Construction and Repair, dry docks are worked exclusively by that Bureau. I beg to call attention to the need of another dock at this yard.

It is often necessary to dock a ship for a somewhat extended period, and where there is only one dock there is nothing to fall back on in case of an emergency.

To illustrate this matter I may take the case of the *Monadnock*. Her belt armor is promised in September or October and should be put on as soon as possible. She is so far advanced that this armor should be put on in dock. Judging from past experience, however, the dock will be in constant service until January or later, while doing necessary cleaning, painting, and repair work upon cruising vessels. Hence fitting the *Monadnock* armor must be postponed or carried on at enhanced cost with the ship afloat.

The gauge of the yard system of railway has recently been partly changed to standard gauge. The railway running by plate rack to wharf where *Monadnock* is being completed is still narrow gauge, as indicated in red on plan No. 1354.

Presumably all railway will be enlarged in the near future, as the present half and half arrangement is scarcely better than no railway at all, so far as the Construction and Repair department is concerned. I recommend that when this change is made the location of the railway be changed as indicated on plan No. 1354, to suit the proposed final arrangement of ship-fitter's machine shed.

A matter which directly affects the economy of conducting work is the location of the office of the department.

There is constant communication going on between the various shops and the office, and for this reason, and also to facilitate effective supervision by the head of department, the office should have the most central location possible. This is not the case now. The office and drawing room force are housed in the main office building, which is not a convenient location,

I beg to recommend the transfer of all office force, including draftsmen, to the square building between the boiler room (No. 69) and the new machine shop (No. 70), shown blank on plan No. 1354.

This building was formerly a small machine shop. The lower floor is partly occupied by a tool room, etc.

To fit it up for offices would require partitions on the upper floor, changes in the small windows now there, and installation of skylights.

This change was recommended by the recent board upon this navy-yard.

The necessary changes in the building are under the cognizance of Yards and Docks, the estimated cost being $4,740, which appears to be a liberal estimate.

In conclusion I venture to urge upon the Bureau the desirability of the ship-fitter's machine shed indicated upon plan No. 1354.

The cost of the building (under cognizance of Yards and Docks) is estimated at about $20,000 only.

Two of the tools (the heavy rolls and the large hydraulic keel-plate bender) that are to go in this building cost $60,000, or three times the cost of the whole building. These, with other tools, have been stored on the yard about two years for lack of a place to erect them.

To sum up, of the improvements under cognizance of Construction and Repair the following should be carried out at the earliest opportunity, to put the yard in a position to handle work which it may be called upon to do at any time. In the absence of a specific appropriation I hope that the Bureau will be able to defray the cost from its current annual appropriation.

1. Completion of furnaces, slabs, etc	$9,380
2. Erection of large rolls	3,100
3. Erection of accumulator	1,800
4. Installation of galvanizing plant	2,200
	16,480

The following improvements are contingent upon the erection of the shipfitters' machine shed and should be appropriated for at the same time:

1. Installation of tools, shafting, foundations, etc	$8,500
2. New shipfitters' tools	13,300
3. Transmission of power	8,000
	29,800

The following improvements in the present shops are very desirable to increase the capacity of the plant and the efficiency and economy of doing work:

1. Tools for machine shop	$6,326
2. Electric plant	15,000
3. Tools for joiner shop	2,765
	24,091

Very respectfully,

D. W. Taylor,
Naval Constructor, U. S. Navy.

Commandant Navy-Yard,
Mare Island, Cal.

NAVAL CONSTRUCTOR'S OFFICE, U. S. NAVY-YARD,
Portsmouth, N. H., August 14, 1893.

SIR: In obedience to the order of the Bureau of Construction and Repair, dated June 6, 1893, No. 7,402, '93, also that of August 10, No. 7402, '93, to furnish the Bureau any information relative to improvements, alterations, or additions, to the construction plant of this yard, to enable work to be performed more economically and promptly. I have to report as follows: I would recommend that the room over the shipfitter's shop, in buildings Nos. 45 and 46, be fitted for a joiners' shop, and the rooms now occupied by the joiners, in building No. 14, be used for other purposes.

Among the principal reasons for this change is the fact there is over 1,500 more square feet of floor space on this one floor than there is in the two floors now occupied by the joiners, in building No. 14. There is also a great advantage in having the workmen and the machine tools all on the same floor, directly under the supervision of the master joiner.

I would recommend that an elevator at the outside of this building be built to facilitate the getting materials in the shop and to remove manufactured articles from the same. Also that the building be piped for heating purposes by using the exhaust steam from the engine. Would also recommend certain changes in building No. 14, known as the "head house" and joiners' shop. The attic of this building is now used for a cabinet shop and varnish room. The space is not properly lighted, and is too small for this use. I would recommend that the cabinet shop be moved down to the next floor below, and that a transverse partition be put in the attic, making two cabinet storerooms, one for old and one for new furniture, doing away with the varnish room on this floor. I would also recommend that a transverse partition be put across the next floor below, making a varnish room and cabinet shop on that floor. This change would give ample room, and cause very little rearrangement of shafting, and would, in my opinion, be a valuable improvement.

The block shop and grindstone room, paint-grinding room, block storeroom, hydraulic room, and engine room are located in the basement of this building, No. 14. In view of all those rooms being located in the basement of this building it will be seen at once that they are very much crowded. The floor of this basement has settled, and apparently the timber is much decayed, and something should be done at once.

I would recommend that the block shop be moved up to the next floor above, and a block shop, block, paint, and store room be fitted up there, together with the saw-filing room. This change would give ample room and plenty of power. A hatch should be cut to the basement, and all material could then be hoisted by the present hoisting gear to the attic, when necessary.

The basement partitions should all be taken down, except around engine, paint, and hydraulic rooms. The grindstone-room floor is very rotten, and should be brought in line with the floor in present block shop. The doors in southwest end of this building should be increased in size, and others cut in northeast end of sufficient size to allow a loaded team to be driven in at one end and out at the other. There is located, in a passageway between the grindstone room and the block shop, running transversely with the building, on this floor, a heavy planer used for planing deck plank and for other purposes. This planer should be moved out and swung around, so the material would pass through longitudinally with the building. This arrangement would allow the stowing of a whole set of deck plank under cover until such time as they could be planed. The old-time grindstone room is not needed, as there are stones, more or less, in all the shops, and it is much better to have the tool-sharpening arrangements near at hand.

To keep the stones and room in proper condition, and to look after belting and water, would require the services of one man nearly all the time, which would seem to be a useless expense, when there is a small gang of shipwrights employed, and as wooden shipbuilding is not likely soon to be revived, there is no particular need of more than three (3) grindstones running at a time, which should be provided for by using condensed water from the engine. There should also be a lamp room provided in this basement, to have an iron or lead lined floor, and to be lined up with lead or iron on the side for 6 feet, the room to be provided with tanks, sink, oil pump, and hot water. Here all lanterns in construction department should be kept ready for use. I would also recommend that the north end of buildings Nos. 45 and 46 be fitted up for a brass foundry, in connection with the ship-fitters' shop, as the shop on Seavy's Island, used as a foundry, needs considerable repairs and is not conveniently located for the foreman in charge. This change would add much to facilities of doing work with dispatch. I would further recommend that a beam shed be provided and located on the proposed site of last year, as shown on the accompanying plan, this building to be one story high, to cover a space 40 feet by 60 feet, to be provided with six forges (two large and four small), also two cranes and overhead trolley. I would also recommend that the following list of machines and machine tools be purchased for the better facilities for performing work in a more expeditious manner in this department:

Heavy machinery and tools.

1 set plate straightening rolls, Hilles & Jones No. 4, to have seven rolls, to be 74 inches between housings, to be able to straighten plates from $\frac{3}{16}$ inch to 1¼ inches in thickness. Estimated cost	$4,650
1 slotting machine, 12 inch, Bement, Miles & Co. Estimated cost	1,475
2 2 by 24 flat turret lathes, Jones & Lamson. Estimated cost, $1,180 each	2,360
1 14-inch, latest improved pattern, extra heavy engine lathe, Putnam Machine Company, with screw and back gear. 10-foot bed. Estimated cost	435
1 30-inch metal planer, to plane 30 inches wide, 30 inches high, and 21-foot bed, Putnam Machine Company. Estimated cost	2,000
1 34-inch gibbed engine lathe, with screw and back gear, Pratt & Whitneys. Estimated cost	3,400
2 improved screw-cutting engine lathes, Brown & Sharpe, 16 inches. Estimated cost, $425 each	850
1 heavy tool grinder, No. 4¼, Springfield, G. & E. W. Co. Estimated cost	275
2 Halsey No. 1 drills, with brace, countershaft, etc., complete, estimated cost, $140 each	280
1 cutter grinder, Pratt & Whitney's, estimated cost	250
1 patent magnetic metal separator, No. 2, Ezra Sawyer, manufacturer, estimated cost	225
1 wooden wheel polishing machine, with floor attachment for endless belt 3 inches wide, Union Stone Company, estimated cost	77
1 bench grinder, No. 1, and endless belt attachment 2 inches, Union Stone Company, estimated cost	48
2 hand jib cranes, of 2 tons capacity, 16 feet 4 inch jib, 17 feet 6 inch column, plate 83, Yale & Towne Manufacturing Company's catalogue, estimated cost, $445 each	890
1 hydraulic jib crane, 20 feet jib, 21 feet column, 4,000 pounds capacity, estimated cost	950
6 pulley block travelers, plate 27, Yale & Towne Manufacturing Company's catalogue, estimated cost, $140 each	840
1 shaping machine, 12 inch, Sellers & Co	485
1 Wells light No. 3 (Wallwork and Wells patent), manufactured by Keegan and Halpin, New York	160
1 double punch and shears for hoop iron, estimated	40
1 Halsey universal brace, estimated cost	65
1 Halsey boiler clamp, estimated cost	15
1 air compressor, air receiver, and oil pump	200
44 burners, patent, for the two (2) furnaces now building, viz, plate and angle, estimated cost $35 each	1,540
Shafting, hangers, wire rope, belting, and pulleys for the transmission of power, estimated cost	900
Labor for foundations, erecting tools, piping, etc., estimated cost	1,150
Total	23,560

Wood-working machinery and tools.

Block shop:	
1 pony planer (Cordesman) estimated	200
1 hand planer and jointer, 20-inch (Cordesman), estimated	135
1 scroll sawing machine, Egan Co's, estimated	150
Coopers shop:	
1 bottom lathe, estimated cost	150
Shipwrights department:	
1 band saw, resawing machine, Egan Co's catalogue, estimated cost	800
Total	1,435

Electric power and lighting plant.

compound wound dynamo, which, when driven at its rated speed, will develop 200 amperes and 110 volts: the speed not to exceed 1,050 revolutions per minute. To be entirely automatic in regulation, so that rapid change of the load of 75 per cent without hand readjustment of the rheostat or brushes will not cause undue sparking at the brushes or overheating of

	dynamo. To be furnished with automatic brush holders which are fixed permanently to the frame of the dynamo, and feed the brushes automatically against the commutator without changing their position from the neutral line on same. To have an efficiency of at least 90 per cent, and the field and armature to have an insullation resistance of not less than 1,000,000 ohms. To be furnished with self-oiling bearings, and supplied with rheostat and suitable base frame with belt tightener complete in all respects. To be placed on foundation built by the Government from contractor's drawings. The dynamo to be driven from shop engine, a counter shaft and pulleys (one of which is to be a friction pulley) and line-shaft pulley for line shaft making 120 revolutions per minute to be furnished. The Government to erect counter shaft and line pulley and furnish all belting. Estimated cost..	$1,053
1	slate base switchboard, to be placed near dynamo with one volt meter of 250 volts capacity, giving continuous indications of E. M. F., with a pilot lamp to be used for the same purpose, and one ammeter of 100 amperes capacity of such type as to be practically unaffected by a change of place of large masses of iron in immediate proximity to the meters; to have necessary switches of capacity sufficient to carry the maximum dynamo load into any of the circuits mentioned below, together with all necessary cut-outs, ampere strips, lightning arresters, etc., complete. Estimated cost..	250
4	circuits (110 volts), completely installed, the following circuits to be established in complete working order and connected to switch-board: One circuit of about 1,400 feet of No. O. O. B. & S. gauge, Grimshaw Competition Line wire, carried along nearest side of dry-dock basin. One circuit of about 1,200 feet of O. O. B & S. gauge, Grimshaw Competition Line wire, carried along one side of ship house No. 5. One circuit of about 2,000 feet No. O. O. B. & S. gauge, Grimshaw Competition Line wire, carried along one side of ship house No. 4 and wharf. One circuit of about 800 feet of No. 1 B. & S. gauge, Grimshaw Competition Line wire, carried along the middle of the two construction and repair shops. Circuits to be carried on poles where not attached to buildings or staging; poles to be 30 feet above ground, trimmed and painted, and supplied with cross-arms, deep groove insulators, and locust pins. The Government to plant all poles, and furnish all unskilled labor in the erection of the above circuits. The contractor to furnish all expert labor, and all materials necessary for the completion of same. All materials and workmanship to be of the very best quality. Estimated cost of the four circuits	1,380
50	50-ampere combined connecting and cut-out boxes, each box to be arranged for attaching four flexible connecting mains to motor, lamp stands or lamps located at such points as shall be deemed necessary for the proper distribution of the current. Drawings showing location of dynamo and circuits will be furnished on application to the commandant of the yard..	
4	portable electric motors, each motor guarantied to develop 2 horsepower on armature shaft, with a difference of potential of 110 volts at the terminals when the shaft is run at the normal speed. Motor to have an efficiency with full load at normal speed of not less that 70 per cent. The motor to be supplied with suitable gearing and spindle for attaching universal joint (for flexible or telescope shaft) which will run at 300 revolutions per minute at normal speed of motor, and to be supplied with a switch and rheostat by which it can be started gradually and run at 300 and 500 revolutions, and at eight different speeds between these as may be required. The speed when thus regulated must not vary more than 10 per cent from full load to no external load, and the motor must be capable of developing not less than 1¼ horse power at any intermediate speed. The gearing to be a rawhide pinion engaging into a bronze gear. All bearings to be made with graphite bushings; motor to be furnished with automatic brush holders, which are fixed permanently to the frame of the motor and feed the brushes automatically against the commutator without changing their positions from the neutral line on same. The motor and gearing to be inclosed in a casing of approved material arranged to permit the oiling of all moving parts. A suspension eye to be placed over center of gravity of motor and case. To be supplied with 100 feet of flexible wire connection on suitable drum, which latter is to be provided with crank for reeling up. The weight of motor, gearing, case, switch, and rheostat, complete, not to exceed 250 pounds. The whole to be constructed for working in damp places and to have an insulation resistance of at least 1,000,000 ohms. Estimated cost of the four motors, $200 each	800
25	hand lamp holders, with Edison key sockets, wire guards and hooks for hanging up, each to have 100 feet of flexible wire connection with attaching strips, estimated cost, $6 each	150

50 Edison 16-candle power lamps for 110 volts, estimated cost	$25
4 portable drills, drills having capacity for drilling holes up to 1¼ inches diameter, reach of arm 21 inches drilling at one setting anywhere over a surface of 43 inches outside diameter and 13 inches inside diameter, arm to be moved in and out by a screw and rotated around the post by a worm and tangent wheel. Spindle to have 5½-inch traverse, and to contain a Morse taper socket; same is to be held in a vertical position by a squaring collar fitted to the under side of the ball on the frame; on removing this collar the spindle (by means of the ball and socket joint) can be set at an angle up to 30 degrees. Post to have 6-inch vertical adjustment to allow for the different length of drills and reducing sockets; it can be held in the split bearing on the side of the base for drilling horizontally. Drill to be fitted with reducing gear and attaching shaft, instead of V; driving cone to receive telescope shaft; estimated cost, $148 each	592
4 telescope shafts, telescope connecting shafts fitted with universal joints guarded with ball at either end, same to have a range of from 5 to 7 feet, and each universal joint so arranged that they can be attached for connecting portable motor to portable drill. Estimated cost for telescope shafts, $45 each	180

The above plant to be equal in all respects to those furnished by Thomas H. Dallett & Co., Philadelphia, Pa.

For poles, erecting same, running wire, line and counter shafts, pulleys, belting, etc., estimated cost	2,000
Total	6,432

Small tools.

12 genuine Packer ratchet drills, No. 3, for Morse taper drills and flat drill socket, estimated cost, $7 each	$84.00
3 genuine Packer ratchet drills, No. 4, for Morse taper drills and flat drill socket, estimated cost, $8.75 each	26.25
6 Billings's improved combination pliers, 6-inch, black finish, estimated cost, 90 cents each	5.40
6 Billings's improved combination pliers, 10-inch, black finish, estimated cost, $1.25 each	7.50
2 Beach's thread-cutting lathe tools, No. 2, V and standard cutter, estimated cost, $2.50 each	5.00
2 Beach's thread-cutting lathe tools, No. 3, V and standard cutter, estimated cost, $3 each	6.00
2 Billings's cutting-off tools, 2 blades, estimated cost, $2.50 each	5.00
2 Billings's surface gauges, estimated cost, $2.75 each	5.50
2 Billings's scratch gauges, No. 1, estimated cost, $2 each	4.00
2 Billings's beam calipers, graduated in sixty-fourths and one-hundredths, estimated cost, $6 each	12.00
12 sets flat drills, for Packer rachets (10 pieces each set), from ⅛ to 1¼ by ⅛ inches, estimated cost, $4 per set	48.00
1 set Lecount's steel clamp dogs, estimated cost	6.50
25 Lecount's heavy steel clamps, No. 1, estimated cost, $1.75 each	43.75
12 Lecount's heavy steel clamps, No. 3, estimated cost, $2.25 each	27.00
12 Lecount's heavy steel clamps, No. 5, estimated cost, $2.75 each	33.00
12 Lecount's heavy steel clamps, No. 7, estimated cost, $3.75 each	45.00
12 Lecount's heavy steel clamps, No. 9, estimated cost, $5 each	60.00
6 Lecount's heavy steel clamps, No. 11, estimated cost, $7 each	42.00
2 Stillson's patent pipe wrenches, 6 inch, estimated cost, 90 cents each	1.80
2 Stillson's patent pipe wrenches, 14-inch, estimated cost, $1.50 each	3.00
2 Stillson's patent pipe wrenches, 24-inch, estimated cost, $3 each	6.00
2 Stillson's patent pipe wrenches, 48-inch, estimated cost, $9 each	18.00
12 standard monkey wrenches, black, 8-inch, 1900, M. M. & M., estimated cost, 40 cents each	4.80
12 standard monkey wrenches, black, 12-inch, 1900, M. M. & M., estimated cost, 55 cents each	6.60
12 standard monkey wrenches, black, 15-inch, 1900, M. M. & M., estimated cost, $1 each	12.00
12 standard monkey wrenches, black, 21-inch, 1900, M. M. & M., estimated cost, $1.40 each	16.80
2 Brock's pipe tongs, No. 3 (1481, M. M. & M.), estimated cost, $4.50 each	9.00
2 Brock's pipe tongs, No. 4 (1481, M. M. & M.), estimated cost, $6.60 each	13.20

1 Tangyes hydraulic bear, No. 1, 3¼ inches to back of gap, ¼ inch to ¾ inch punches, estimated cost	
1 steel screw punch, No. 830 M, M, and M, No. 1, estimated cost	
1 steel screw punch, No. 830 M, M, and M, No. 2, estimated cost	
1 steel screw punch, No. 830 M, M, and M, No. 3, estimated cost	
1 set lightening dies from ¼ to 1 inch, varying by 1/16 inch, and to 1½ by ⅛ inch, 17 dies with die stocks, one each, 23, 29, and 53 inches, estimated cost	
1 set lightening taps, taper, plug and battening, ¼ to 1½ by ⅛ inch, with adjustable tap wrenches, two each, 15 and 20 inches, estimated cost	
1 set pipe taps, right and left, from ¼ to 3 inches, estimated cost	
1 set pipe reamers ¼ to 3 inches, estimated cost	
1 set Armstrong No. 2 adjustable stock and pipe dies, R and L, ¼ to 1 inch, in case, estimated cost	10.00
1 set Armstrong No. 3 adjustable stock and pipe dies, R and L, 1 to 2 inches, estimated cost	30.00
1 set Armstrong No. 6 adjustable stock and pipe dies, R and L, 2½ to 3 inches, estimated cost	41.00
1 set Armstrong No. 2 adjustable stock and brass pipe dies and taps, R and L, ⅛ to 1¼ inches	35.00
7 sets Morse twist drills, ¼ to 1½ inches, varying by 1-16 inch; estimated cost $18 each	126.00
2 sets Morse twist drills, ¼ to ¾ by 1-32 inch, ¾ to 1½ by 1-16 inches; estimated cost $22.50 each	45.00
3 sets steel sockets, 100 A, Nos. 1, 2, 3, and 4; estimated cost, $8.50 each	25.50
3 sets steel sleeves, 100 B, Nos. 2 and 3; estimated cost, $8 each	24.00
3 sets taper reamers, 118, Nos. 1 to 5 inclusive; estimated cost, $16 each	48.00
2 sets bill stock taper reamers, 120 B, ¼ to ¾ by 1-16 inch; estimated cost $5.50 each	11.00
2 lathe threading tools No. 130, Morse, holder and two cutters; estimated cost $2 each	4.00
1 Westcott scroll combination lathe chuck, 10½ inches, 4 jaws; estimated cost	31.50
1 Westcott scroll combination lathe chuck, 16 inches, 4 jaws; estimated cost	48.00
2 Westcott little giant drill chucks, No. 2; estimated cost $7.50 each	15.00
1 Westcott little giant drill chuck, No. 4; estimated cost	15.00
6 portable forges, Sturtevants, No. 3, diameter 21 inches; estimated cost $20 each	120.00
1 speed indicator, No. 314, M. M. & M.; estimated cost	5.00
3 pocket speed indicators, No. 315, M. M. & M.; estimated cost 75 cents each	2.25
3 Brown & Sharpe's mercury plumb bobs, 3½ ounces; estimated cost $1 each	3.00
2 Brown & Sharpe's mercury plumb bobs, 6 ounces; estimated cost $1.50 each	3.00
2 Brown & Sharpe's micrometer calipers, No. 15, in case; estimated cost $5.75 each	11.50
1 Brown & Sharpe's micrometer caliper. No. 30, in case; estimated cost	9.00
4 Brown & Sharpe's pocket screw and wire gauge; estimated cost $2.50 each	10.00
1 Brown and Sharpe, American standard wire gauge, round O–36, estimated cost	3.50
1 Brown and Sharpe, English standard wire gauge, round 1–36, estimated cost	2.00
3 Chesterman's steel tapes, 50 feet, in case, estimated cost 5.76 each	17.28
3 Chesterman's steel tapes, 100 feet in case, estimated cost $10.04 each	30.12
2 sets steel stamping figures and letters, complete; 3–16 inch, estimated cost $4.85 each	9.70
2 sets steel stamping figures and letters, complete, ⅜ inch, estimated cost $9.70 each	19.40
2 sets steel stamping figures and letters, complete, ½ inch, estimated cost $13 each	26.00
1 combination pipe vise, No. 1, No. 1516 M. M. & M., estimated cost	16.80
1 Providence vise, Providence Steam and Gas Pipe Co., estimated cost	22.50
4 store trucks, Weston's pattern, No. 2, full ironed, estimated cost $7.35 each	29.40
4 bell bottom jackscrews, 1¼ inch screw, 6-inch length, 2318, M. M. & M., $1.35 each	5.40
4 bell bottom jackscrews, 1¼ inch screw, 10 inch length, 2318, M. M. & M., $1.80 each	7.20
2 bell bottom jackscrews, 2 inch screw, 16 inch length, 2318, M. M. & M., $3.15 each	6.30
1 hydraulic pulling jack, to pull 10 tons 2 feet, 2366, M. M. & M.	176.00
6 dirt barrows, tubular iron, No. 6, 2192, M. M. & M., $7.50 each	45.00

2 Weston's direct pulley blocks, ½ ton capacity, estimated cost $9.75 each..	$19.50
2 Weston's geared pulley blocks, 3 tons capacity, estimated cost $39 each..	78.00
2 crabs, Weston's patent safety hoisting, 2½ tons, No. 25, estimated cost $100 each	200.00
2 winches, Weston's patent safety, hoisting 2½ tons, No. 35, estimated cost $100 each	200.00
1 hand diamond tool, for emery wheels, estimated cost	10.00
1 lathe diamond tool, for emery wheels, estimated cost	15.00
3 wood-polishing wheels 12 inches, 1½-inch face, estimated cost $3.20 each.	9.60
3 wood-polishing wheels 16 inches, 2-inch face, estimated cost $4.05 each..	12.15
3 wood-polishing wheels 20 inches, 2½-inch face, estimated cost $5.20 each..	15.60
3 wood-polishing wheels 24 inches, 3-inch face, estimated cost $6.75	20.85
25 feet polishing belts, 1 inch wide, estimated cost 10 cents each	2.50
25 feet polishing belts, 2 inches wide, estimated cost 20 cents each	5.00
25 feet polishing belts, 3 inches wide, estimated cost 30 cents each	7.50
12 emery wheels, 6 by ¾ inch wide, estimated cost $1.15 each	13.80
12 emery wheels, 8 by ¾ inch wide, estimated cost $2.50 each	30.00
12 emery wheels, 8 by 1 inch, estimated cost $3 each	36.00
12 emery wheels, 12 by 1 inch, estimated cost $5.25 each	63.00
6 emery wheels, 12 by 1½-inches, estimated cost $7.50 each	45.00
6 emery wheels, 18 by 2 inches, estimated cost $21 each	126.00
6 emery wheels, 18 by 3 inches, estimated cost $30.50 each	183.00
18 tuyers irons, fig. 1518, Thorton and catalogue, estimated cost $5 each....	90.00
1 pipe forming machine; plumber-shop, estimated	26.00
1 patent, improved, squaring shears, for plumber-shop, estimated cost	45.00
1 tin folding machine; plumber-shop, estimated	40.00
1 small burring machine; plumber's shop, estimated	8.50
Total	3,315.11

Summary.

Estimated cost for labor and materials, viz:

For heavy machinery and tools	$23,560.00
Woodworking machinery for block shop	485.00
Woodworking machinery for cooper shop	150.00
Woodworking machinery for shipwright's department	800.00
Electric power and lighting plant	6,432.00
Small tools, etc.	3,315.11
Fitting up joiners' shop in buildings Nos. 45 and 16, including cost of elevator, piping for heating building, etc., and for moving tools	4,000.00
Alterations and changes proposed in building No. 16, known as "headhouse and joiners' shop," including the removing of block shop to floor above and removing the cabinet-maker to floor below; also changing tools and repairing basement flooring, and building lamp room	3,000.00
Fitting building Nos. 45 and 46 for brass foundry	2,000.00
Building beam shed 40 by 60 feet, one story high, including forges, chimney, blower, steel pipes, two cranes, and overhead trolleys, etc	4,000.00
Total	47,742.11

Very respectfully, your obedient servant,

JOHN B. HOOVER,
Naval Constructor, U. S. Navy.

The COMMANDANT.

COMMANDANT'S OFFICE,
U. S. Navy-Yard, Portsmouth, N. H., August 15, 1893.

Approved:

C. C. CARPENTER,
Commodore, U. S. Navy, Commandant.

NAVAL CONSTRUCTOR'S OFFICE,
U. S. Navy-Yard, Boston, July 11, 1893.

SIR: In compliance with Bureau Order No. 7402, '93, dated June 6, 1893, I have the honor to submit the following report, suggesting alterations and additions to construction plant, which will, in my opinion, enable the work to be performed more promptly and economically than at present.

Three plans, A, B, and C, relative to ship-fitting machine shop, showing struc of building and location of tools, are herewith submitted.

Plan A shows position of tools as at present. Plan B shows proposed cha in line shafting, location of tools, etc. Plan C gives transverse sections at various points in building; shows lead of and quarter turn in main driving belt required by change in direction of line shafting proposed. Plan D shows proposed building for plate rack and forge shed with its location relative to adjacent buildings. Plan E shows end elevation of building No. 36, with proposed door shown in red.

SHIP-FITTING MACHINE SHOP.

Proposed change in line shafting, tools, etc.: By reference to plan A it will be readily seen that no adequate provision has been or can be made for transportation of material to and from tools, either by traveling crane H or trolleys, owing to location of beams, shafting, belts, etc. Plan B provides for a change in run of line shafting from a transverse to a longitudinal position in shop, turning and rearranging the tools to correspond, cutting of center portion of and lowering beams, providing platforms and walks over same, thus allowing the use of traveling crane H (now useless), and for longitudinal and transverse trolleys to material and tools. The building should also be brought down to grade, and the railroad track continued down its center, as shown on plan. It is therefore recommended that plan B be adopted and changes made to correspond therewith.

Estimated cost.

Labor	$3,540
Material	2,214
Total	5,754

PLATE RACK AND FORGE SHED.

An iron building for storage of plate steel angles and other shapes, fitted with a traveling crane and the necessary rack for holding plates on edge, is recommended (see plan D). It is also recommended that the extension E (see plan D) be utilized as a forge shed and fitted with a rotary crane, for convenience in handling plates, beams, etc.

Estimated cost.

Labor	$12,707
Material	5,429
Total cost, buildings	18,136

PROPOSED ADDITION TO BOILER AND ENGINE ROOM.

With a view to providing room for an additional boiler, the electric, hydraulic and air-compression plant, it is recommended that the present frame engine and boiler house (see plan A) be removed, and that the space between the tool room T and bending-roll shed U, 68 feet 1⅝ inches in length, be utilized for the purpose, having a transverse section like N O (see plan C). In order to bring the above plant wholly under the eye and control of engineer in charge, it is recommended that the end of tool room V W be moved to X Y (see plan B).

Estimated cost.

Labor	$3,520.00
Material	1,448.21
Total	4,968.21

PICKLING TANKS AND CONNECTIONS.

The location of pickling and fresh water tanks are shown on plan D, at end of plate rack, and are located with a view to convenience in handling plates. Plates selected for use are taken from rail truck as it leaves the building by an 18-foot jib crane (available for the purpose) and readily deposited in either tank. These tanks will be of the following (in the clear) dimensions: Length, 25 feet 3 inches; breadth, 2 feet 2 inches; depth, 6 feet 6 inches; to be built of 3-inch white pine and lead lined. The tank pits will be brick lined, laid in cement, and made water-tight.

Estimated cost.

Labor	$658
Material	620
Total	1,278

BOILERS.

Boilers Q and R now in position (see plan A) require repairs; the water legs leak, and steam, above 70 pounds pressure, is forbidden. These boilers, when in good condition, will not furnish sufficient steam for all purposes when shop and sawmill are in full operation. It is therefore recommended that the two boilers, nearly new, and no longer required for dry-dock use (new boilers and engines having been supplied), be taken for the purpose, boiler R be thoroughly repaired, and all put in good condition.

Estimated cost for transportation, uptake connections, and repairs:

Labor	$1,025
Material	250
Total	1,275

PROPOSED DOORS IN END OF BUILDING NO. 36 (JOINER SHOP).

In the construction of this building no provision has been made in size of doors in basement story to admit of loaded teams, in consequence of which all material for use of workmen in the different departments has to be unloaded outside and taken in by hand. At present the basement story is occupied as a boat shop and by the necessary heavy tools, planers, saws, etc. I have, therefore, to recommend, for convenience in removing large boats, admission of loaded teams, and additional light, now much needed, that a door be cut in each end of building, as shown on plan E, in red dotted line.

Estimated cost.

Labor	$1,350
Material	650
Total	2,000

SHIP HOUSE WOODEN BUILDING NO. 92, LOCATED ON SOUTH SIDE OF AND NEAR DRY DOCK.

This building is 200 feet long by 63 feet wide. By being strengthened and repaired (it needs new sills and shingling) it could be used as a shipwrights' shop, and a second story or floor could be placed therein, the height between ground and roof being ample for the purpose. This floor could be used for light work, storage of tools, molds, rigging, etc. One end could also be used for a paint shop. Temporary repairs on boats, spars, etc., could be done in this building, the launching ways being available for hauling out.

A building of this description is absolutely necessary in the immediate vicinity of dry dock for necessary repairs to vessels therein. I earnestly recommend that the repairs enumerated be made.

Estimated cost.

Labor	$3,650
Material	1,850
Total	5,500

*Schedule of tools and material required for construction plant under **Bureau order.***

1 set plate-straightening rolls, pulley driven with friction clutches; 6 rolls, 12 inches diameter, 98 inches between housings. Estimated price, complete and in position	$4,000.00
1 horizontal flange punch, 8-inch throat, capable of punching 1-inch steel plate or angle, to be pulley driven, pulleys 24 inches diameter, 6¼-inch face, speed 176 revolutions. Estimated price, complete and in position.	825.00
1 horizontal flange punch 42-inch throat, capable of punching ⅝-inch steel plate. To be pulley driven, pulleys 24 inches diameter by 6¼-inch face, speed 176 revolutions. Estimated cost, complete and in position	1,100.00
1 double angle shear capable of shearing angles 6 by 6 inches, pulley driven, pulleys 24 inches diameter by 6½-inch face, speed 230 revolutions. Estimated price complete and in position	1,000.00
2 No. 2 combined punch and shear complete, with electric motor for driving same, equal to Hilles & Jones Co., as per catalogue, page 22. Estimated price each, complete and ready for use, at $1,250	2,500.00
1 electric dynamo and attachments complete, including switch-board, containing ammeter, voltmeter, and double-pole switch, slate mounted, machine to run 1,200 revolutions of the armature per minute and develop an electro-motive force of 125 volts and a current of 200 amperes. Estimated cost delivered at this station set up and run for approval.	1,190.00
2 shunt-wound drill motors, capable of developing 4-horse power by brake, with a difference of potential of 100 volts, each motor to be provided with a strong oak base, swivel trucks, and 100 feet of flexible wire connection. Estimated cost per motor, $750	1,500.00
100 50-candle power Edison lamps of 100 volts; 200 20-candle power Edison lamps of 100 volts; 100 pounds insulated wire. Estimated cost	320.00
1 20-horse power portable engine and boiler, with frame truck hoisting gear, belt pulley, and independent steam pump; boiler to be a vertical cylinder 42 inches diameter, 8 feet high, containing 85 2-inch tubes 60 inches long; engine to be double-cylinder type, cylinder 7 inches diameter; stroke of piston 12 inches; must have power to lift a weight of 5,000 pounds; estimated total weight 6,000 pounds. Estimated cost	1,250.00
1 heavy pulley-block traveling crane equal to the Yale & Towne, having a span of 26 feet and capable of transporting a weight of 10,000 pounds; to be provided with trolley, pulleys, and propelling gear complete. Estimated cost ready for use	1,100.00
1 suspended rotary bridge crane, including suspended track connections, fitted with three arms, trolley and pulley to each; each arm with its trolley, pulley, and connections to be capable of lifting 6,000 pounds; length of arms, 24 feet; to be equal to the Yale & Towne crane. Estimated cost ready for use	1,200.00
2 No. 9 Stow portable drills and all attachments complete. Estimated cost, each, $220	410.00
2 No. 6 Stow portable drills and all attachments complete. Estimated cost, each, $157	311.00
2 cutting-off circular saws, 26 inches diameter, mandrel hole 1⅜ inches diameter, No. 7 gauge. Estimated price, $12 each	24.00
1 circular saw, splitting, 26 inches diameter, mandrel hole 1⅜ inches diameter, No. 10 gauge. Estimated cost	12.00
1 cutting-off circular saw, 17 inches diameter, mandrel hole 1 inch diameter, No. 12 gauge. Estimated price	6.00
1 cutting-off circular saw, 12 inches diameter, mandrel hole 1 inch diameter, No. 15 gauge. Estimated price	3.00
1 circular saw, splitting, 17 inches diameter, mandrel hole 1 inch diameter, No. 12 gauge. Estimated cost	6.00
1 Hoe patent steel duplex swage for large circular saws. Estimated cost	350.00
1 No. 1 double-geared saw gummer for large circular saw. Estimated cost.	20.00
1 automatic knife-grinding machine, to grind planer knives, 30 inches long. Estimated cost ready for use	150.00
1 dozen steel boiler clamps, to open 4 inches from center of screw, screw to run back 4½ inches. Estimated cost	48.00
1 box containing a set of Grant's No. 1 diestock, dies, taps, taper plug, and bottoming tap ¼ to ½ inch. Estimated cost	24.60
1 box containing a set of Grant's No. 2 diestock, dies, taps, taper plug, and bottoming tap $\frac{5}{16}$ to ¾ inch. Estimated cost	37.00
1 box containing a set of Grant's No. 3 diestock, dies, taps, taper plug, and bottoming tap ½ to 1 inch. Estimated cost	45
1 box containing a set of Grant's No. 4 diestock, dies, taps, taper plug, and bottoming tap 1 to 1¼ inches. Estimated cost	

MORSE PATENT INCREASED TWIST DRILLS.

1 dozen ¼-inch	$7.20
1 dozen 5/16-inch	7.80
1 dozen ⅜-inch	9.60
1 dozen 7/16-inch	10.80
1 dozen ½-inch	12.00
1 dozen 9/16-inch	14.40
1 dozen ⅝-inch	16.80
1 dozen 11/16-inch	19.20
1 dozen ¾-inch	22.20
1 dozen 13/16-inch	25.80
1 dozen ⅞-inch	29.40
1 dozen 15/16-inch	33.00
1 dozen 1-inch	36.00
1 dozen 1 1/16-inch	40.80
1 dozen 1⅛-inch	45.60
1 dozen 1 3/16-inch	50.40
1 dozen 1¼-inch	54.00
Estimated total cost	435.00

LEATHER BELTING.

70 feet 24-inch belting (leather link), at $6	$420.00
250 feet 24-inch belting (leather double), at $6	1,500.00
100 feet 9-inch belting (leather double), at $1.73	173.00
600 feet 6-inch belting (leather double), at $1.14	684.00
200 feet 4½-inch belting (leather double), at 84 cents	168.00
500 feet 4-inch belting (leather double), at 75 cents	375.00
300 feet 3½-inch belting (leather double), at 65 cents	195.00
250 feet 3-inch belting (leather single), at 36 cents	90.00
Estimated total cost	3,605.00

HYDRAULIC PLANT.

1 hydraulic ram accumulator pump and connections complete, ram 12 inches diameter, 16-inch stroke, and capable of exerting a pressure of 2,000 pounds per square inch. Estimated cost complete and in running order	2,200.00

HYDRAULIC RIVETERS.

1 hydraulic riveter capable of riveting plates 36 inches wide and rivets 1 inch diameter. Estimated cost	550.00
2 hydraulic riveters, capable of riveting plates 54 inches wide and rivets 1 inch diameter. Estimated cost, each, $750	1,500.00

Recapitulation.

New buildings.	Labor.	Material.	Total.
Ship-fitters' machine shop	$3,540	$2,214.00	$5,754.00
Plate rack and forge shed	12,707	5,429.00	18,136.00
Boiler and engine room, proposed addition to	3,520	1,448.21	4,968.21
Pickling tanks and connections	658	620.00	1,278.00
Boilers	1,025	250.00	1,275.00
Proposed doors in end of building No. 36 (joiner shop)	1,350	650.00	2,000.00
Ship house, wooden building No. 92	3,650	1,850.00	5,500.00
Total cost	26,450	12,461.21	38,911.21

Recapitulation—Continued.

New tools.	Total cost.
Plate straightening rolls	$4 [illegible]
1 horizontal flange punch	[illegible]
1 horizontal flange punch	1,[illegible]
Double angle shear	1,00[illegible]
2 No. 2 combined punches and shears, at $1,250	2,50[illegible]
1 electric dynamo	1,190.00
2 shunt-wound drill motors, at $750	1,500.00
300 Edison lamps and wire	320.00
1 portable engine and boiler	1,250.00
1 heavy pulley-block traveling crane	1,100.00
1 suspended rotary bridge crane	1,200.00
2 Stow portable drills, No. 9, at $220	440.00
2 Stow portable drills, No. 6, at $157	314.00
2 circular saws, 26 inch, at $12	24.00
1 circular saw, splitting, 26 inches	12.00
1 circular saw, 17 inches	6.00
1 circular saw, 12 inches	3.00
1 circular saw, splitting, 17 inches	6.00
1 duplex swage	350.00
1 double-geared saw gummer	20.00
1 automatic knife grinder	150.00
1 dozen boiler clamps	48.00
1 box No. 1 taps and dies	24.00
1 box No. 2 taps and dies	37.00
1 box No. 3 taps and dies	45.00
1 box No. 4 taps and dies	90.00
17 dozen Morse patent drills	435.00
Leather belting, 2,270 feet	3,605.00
Hydraulic plant	2,200.00
1 hydraulic riveter	550.00
2 hydraulic riveters, at $750	1,500.00
Total new tools	26,144.00
Total new buildings	38,911.21
Grand total	65,055.81

Very respectfully,

WM. HICHBORN,
General Foreman in Charge Department Construction and Repair.

The COMMANDANT.

NAVAL CONSTRUCTOR'S OFFICE,
Navy-Yard, League Island, Pa., July 7, 1893.

SIR: In compliance with Bureau's letter No. 7402, '93, desiring a report relative to the improvement, alteration, or addition to the construction plant of the yard, etc., I respectfully submit the following suggestions and plans, designated as follows: (1) Plan of construction buildings; (2) boiler-house; (3) engine-house; (4) ship-fitting shed; (5) ship-fitting shed, cross section; (6) smitheries; (7) smitheries, cross section; (8) boat shop and mold loft; (9) boat shop and mold loft, cross section; (10) furnaces; (11) furnaces; (12) furnaces, details; (13) rope power for ship-fitting shop.

On plan 1 is shown so much of the yard as is chiefly occupied by the Construction and Repair department. The dotted lines in black represent the improvements recommended by the board October 10, 1889, and the additional buildings, shown in red, suggested in this report conform in general with the plan of said board.

It will be noticed that these additional buildings are located with a view of bringing the several shops as closely together as is practicable, thereby facilitating general supervision, and also to locate the shops within easy reach of the docks and building slips.

Another advantage obtained by this concentration of workshops is that the steam power which runs the tools and other appliances in one shop may be extended to adjoining buildings, thus effecting a saving in first cost of engines and boilers, and greatly reducing the annual cost in supplying steam power for the several shops.

Taking up the several proposed improvements in their order of immediate importance, I beg leave to reiterate my suggestion of last year (September 1, 1892) relative to the new engine house and boiler house.

The boilers (2 in number) to supplant those which for years have supplied the sawmill and ship-fitting shop with power, are on the ground; the concrete foundation has been prepared in the place approved by the Bureau, and the contractor has been notified to proceed with his work of setting the boilers. This latter work will probably be completed within 60 days, when steam connections can be made and the new boilers will be put into use. As yet, however, no provision has been made for housing the boilers, and it is recommended that a building, such as shown on plan 2, be erected. This building, composed of iron and corrugated galvanized iron, can be put up for $3,400, including the pile and concrete foundation already in place.

A new engine has been contracted for, and, I am credibly informed, will be delivered as soon as the foundation is ready to receive it. The location of this engine has been approved by the Bureau, but no money has been allowed for the erection of a house. As the contractor is to set up the engine upon the foundation prepared by the Government, I would respectfully recommend that permission and funds be granted to proceed with the necessary preliminary work and that provision be made for housing the engine when in place, either with temporary boarding or a permanent building such as is shown on plan 3. The latter, in my opinion, is much preferable, being less costly after all, and affording better protection to the costly engine and appurtenances. Estimated cost of engine house, $6,800.

Steam to the new engine will be led overhead from the boilers through pipes on an iron girder reaching between the two buildings, leaving a passageway of about 30 feet between the engine house and boiler house.

SHIP-FITTING SHED.

To carry on repairing work upon ships at the wharves or in the dock with dispatch and economy, a ship-fitting shed, as shown on plan 4 and 5, is recommended. The proposed structure is 274 feet by 100 feet and in close proximity to the ship-fitting shop. Only iron and glass are used in its construction. The sides consist solely of sliding doors, each door sliding inside and outside of the posts. This arrangement is labor-saving in that it is possible to take work out of the building at any part of it with less handling than where doors are placed at certain intervals. Then, again, light and ventilation can be had to a greater extent, making it convenient for carrying on such work as can not be accommodated in the ship fitting shop. It is suggested that under this shed should be located the furnaces and bending slabs, the scrive board, plate-pickling baths, hydraulic keel-plate bender, and such smaller tools as punches, shears, multiple drills, etc., as require considerable space when working long plates and angle bars.

It is further contemplated to place the brass foundry, tinning, plumbing and galvanizing shops under the roof of the ship-fitting shed. The present brass foundry is located near the steam engineering buildings, and is not in a convenient place. The house is of frame and much in need of repairs. As all the buildings on the yard ought to be made as nearly indestructible as possible, it is recommended that a new brass foundry be built upon the space designated on plan 4, to be constructed of the same material and uniform with the new boiler house proposed. A tinning and plumbing shop has been fitted up in the north end of the blacksmith shop and will suit the purpose for some years, but the most suitable location of these shops is undoubtedly that indicated on plan 4, incorporated under the ship-fitting shed.

I beg leave to urgently recommend an appropriation for this ship-fitting shed, as it must prove itself a great convenience for work that can not well be carried on in the ship-fitting shop, and it would do away with the erection of detached shops and buildings such as the boiler house, brass foundry, and plumbing, tinning, and galvanizing shops. The estimated cost of this ship-fitting shed is $58,221; the cost of the proposed new boiler house is $3,400; allowing $3,400 for each of the other two buildings covering the brass foundry and the plumbing, tinning and galvanizing shops there is a total of $10,200. If these buildings were erected and in the course of time it is found desirable to erect a ship-fitting shop, then these three buildings would have to be removed and the first outlay would be an almost entire loss.

BRASS FOUNDRY.

One of the first needs is that of a brass foundry. As stated in report of September 1, 1892, that of the steam engineering might be repaired and made to answer temporarily. It is equipped with cranes, drying ovens, as well as smelting furnaces. None of these appliances, however, have been in use for a long time, and the foundry has not been in operation for about ten years. It is therefore not possible to state precisely what its actual condition is without a thorough survey, and there are no crucibles, sand, tools, and other requisites with which to ascertain its worth. I therefore recommend the erection of a brass foundry to be built of iron, and to have it equipped with all the necessary appliances for supplying the fittings of ships.

BOAT SHOP.

There is no boat shop proper at this yard. The old frigate house has been utilized as a boat shop, but at considerable disadvantage toward economy and dispatch of work. The building being of frame and approximately fifty years old, is dangerous because being of wood, and although its supports have been looked after and repaired where found needed during the past year, the building is by no means absolutely safe. The boat shop located in the second story is unhandy for the admission and exit of boats; it is dark in the shop and the floor is shaky and unreliable. The danger of the building collapsing under a strong wind or of being destroyed by fire is advanced as a reason why it should be abandoned and a suitable place built where human life and Government property would be safe. I therefore recommend the erection of a brick building 100 feet by 65 feet exterior dimensions, two stories high, to be located as shown on plan No. 1. The ground floor of this building to be used, as shown on plan 8, as boat-building shop, boat repairing and painting, and the north end as cooper and block shops. The engine running the joiner-shop tools is located only 60 feet to the east of the proposed boat shop, and this engine is of sufficient capacity to run all the machine tools and saws in the proposed shops.

MOLD LOFT.

The present mold loft in construction and repair building is entirely unsuited for the purpose intended. The constructor's offices, clerk's office, and drafting rooms in the north end take up 75 feet in length. The joiner shop takes in 208 feet and only 110 feet remain, which is partly used for storage of furniture. The floor is badly worn and could not be used for laying off purposes without entire renewal. It is, besides, too small to be used as a mold loft, and as a shelter is much needed for the storage of furniture, it is well adapted for the purpose; the upper story in the proposed boat shop has been designated for a mold loft.

SMITHERY.

The present smithery is a frame building constructed about eighteen years ago. It is 254 feet by 40 feet and 20 feet high under the eaves. During the past year the building has been thoroughly repaired, and is probably good for eight or ten years. The north end contains the engines and boilers, occupying 64 feet in length, next to which a space of 28 feet has been fitted up as a tinning, plumbing, and copper shop, leaving 191 feet for smithery proper. This space accommodates eighteen fires and three steam hammers of 200, 400 and 800 pounds, respectively. The capacity for work is very limited, owing chiefly to the lack of heavy hammers, nor would it be possible to introduce any of the requisite size because of the limited space in every direction. The chief objection to this structure is the material of which it is built, and it would not be advisable to either enlarge it or introduce any additional hammers. While it is not likely that a suitable shop will be built for some years, I have anticipated such a contingency and outlined, in a general way, my idea of a smithery capable of turning out all the work that may be demanded from a thoroughly equipped navy-yard. Its proposed location is indicated on plan 1, and general plans and arrangements are shown on plans 6 and 7. It contemplates two separate shops 400 feet in length, with an L at each end of 56 feet, and 75 feet outside width. These buildings are placed so as to form a quadrangle, with a driveway of 20 feet between them, giving access to the interior space between the buildings 125 feet by 250 feet. The engine and boiler house are located in this courtyard. The west building is to be used for heavy forging and angle smithery. It will contain four reverberatory furnaces, assorted heavy steam hammers, and an overhead traveling-crane. To prevent as much as possible the accumulation of smoke, which usually fills the shops in the morning when fires are started, and during muggy weather, when there is little or no draft, it is proposed to fit a canopy over each fire to which a pipe is attached, the latter communicating with a central flue running underground through the entire length of the shop, out into the smokestack in the yard. I believe that a suction of air through this main flue, induced by fans, would greatly reduce, if not entirely remove, the dense smoke which otherwise would have no outlet except through the roof, skylight, or open windows. The east building is designed for general ship-smith work and contains 61 forges, steam hammers, and other appliances, and sufficient space for material required to be kept on hand for daily use. The estimated cost of these two smitheries is $310,000.

SHIP-FITTING SHOP.

The floor in this building has been one-third renewed during the past year. It is urgently recommended that authority be granted to proceed with this much-needed improvement, as the old floor is badly decayed in places and no longer affords proper foundation for the many fine machine tools distributed about the shop. Estimated cost $6,000.

The following additional tools are recommended to be purchased for this shop:

Two 16-inch screw cutting lathes, at $500	$1,000
One 20-inch screw cutting lathe	800
One Acme double-head screw-cutting machine	600
Two radial drill presses, 60-inch, at $1,100	2,200
One triple-gear shaping machine	400
Three grinding-machines, emery wheels, at $100	300
One 2 by 4 turn-table turret lathe	1,100
One hand-bending roll, 4 inches by 48 inches	100
One centrifugal chip and waste cleaner	125
One multiple drilling machine	2,800
One grindstone with iron frame, complete	80
One metal band saw	400
One Detrick & Harvey open side planer	3,000
One plate shearer, 8 feet between housings	4,000
Total	$16,905

The following tools and appliances under the proposed ship-fitting shed are recommended:

Plate and angle furnaces	$9,000
Bending slabs	4,800
Hydraulic keel-plate bender	8,000
Tanks and cranes for pickling plates	2,500
Total	24,100

As yet only the tools located on the west side of the ship-fitting shop have been operated, but the shafting and pulleys are all in place and it only remains to transmit the power across the shop. As it is intended to run an overhead traveling-crane through the entire length of the shop, it will not be convenient to bring the power either overhead or at either end of the shop, the latter being objectionable on account of the tendency to twist the shafting, and it is recommended that the power be transmitted underground from one side of the building to the other at the half length of the shop. The details of this plan are shown on plan 13, and has been adapted from that of the Cresson works, which gives satisfaction.

Plans 10, 11, and 12 show general outlines of proposed angle and bar furnaces, similar to those in use at Sparrows Point. There is, however, a difference of opinion as to the advantages claimed for the cylindrical steel or iron shell angle furnace, and also as to the benefits from the use of petroleum for heating over the usual kind of furnace and fuel. My preference leans toward coal for heating, the disadvantages of the dust being more than compensated for, through the simplicity and absolute safety of its use, against the risk of using an inflammable oil and the liability of pipes and valves getting choked and failing to work when perhaps most needed.

In conclusion, I beg leave to summarize the recommendations contained in this letter under "Immediate requirements" and "Future improvements," in the order of their importance:

Immediate requirement.

Permanent improvements:

Boiler house	$3,400
Engine house	6,800
Brass foundry	3,400
Floor in ship-fitting shop	6,000
Rope power	3,000
Total	22,600

Tools and appliances:	
Tools for ship-fitting shop	$16,905
Furnaces	9,000
Bending slabs	4,600
Pickling tanks	2,500
Fitting up brass foundry, tools, etc	1,500
Total	34,505

Future improvements.

Permanent buildings:	
Ship-fitting shed	$58,221
Boat shop and mold loft	150,000
Smitheries	310,000
Total	518,221

Tools and appliances:	
Hydraulic keel-plate bender	8,000
Electric motor plant	10,000
Total	18,000

Very respectfully,

J. Feaster,
Naval Constructor, U. S. Navy.

The Commandant.

REPORT

OF THE

CHIEF OF THE BUREAU OF STEAM ENGINEERING.

NAVY DEPARTMENT,
BUREAU OF STEAM ENGINEERING,
Washington, September 29, 1893.

SIR: In obedience to your order of June 15, I have the honor to submit to the Department the Annual Report of this Bureau, together with estimates for the fiscal year ending June 30, 1895.

APPROPRIATION, STEAM MACHINERY, 1893.

Amount appropriated for fiscal year ending June 30, 1893; act approved July 19, 1892		$650,000.00
Labor in navy-yards and stations in repair of steam machinery, boilers, etc., of naval vessels fitting for sea service, and preservation of tools, handling and preservation of materials, stores, etc	$401,791.08	
Purchase of materials, stores, machine tools; freight and incidental expenses	198,588.83	
Payments for repairs, materials, freight, and incidental expenses on foreign stations	36,992.36	
Total	637,372.27	
Less repayments by transfers in the adjustment of appropriations	19,438.85	
Total expenditures		617,933.42
Balance on hand		32,066.58
Obligations of the Bureau to be paid from this balance:		
Approved requisitions (estimated)	6,609.84	
Unfilled contracts, orders, and reservations	9,938.06	
Total obligations		16,547.90
Balance remaining to credit of the appropriation		15,518.68

GENERAL OPERATIONS OF THE BUREAU.

A full set of drawings has been prepared for the machinery of the revenue cutter *Calumet*, now building at Buffalo, at the request of the Treasury Department.

Designs for the machinery of sea going battle ship No. 1, *Iowa*, and armored cruiser No. 3, *Brooklyn*, have been completed.

Working drawings for new machinery for the U. S. tug *Nina* have been completed, and plans for similar machinery for the *Leyden* are now being prepared.

Plans have been commenced for new machinery for the *Hartford*, in which vessel it is proposed to place compound engines capable of developing about 2,000 I. H. P., instead of her present simple engines. Four cylindrical boilers, designed for a steam pressure of 110 pounds per square inch, will be put in place of her two rectangular ones. The proposed change will effect a saving of 92 tons in weight, which, if added to the coal carried, will give an increased radius of action of about 900 miles.

The plans and specifications for the machinery of the three new gunboats authorized by the last Congress have been made.

One of these, No. 7, will be furnished with quadruple expansion engines of about 1,750 I. H. P.; the other two, Nos. 8 and 9, will have triple expansion engines of 1,600 I. H. P.

Designs have also been made for the machinery of four third-class torpedo boats.

Two of these boats are to have quadruple-expansion engines of 200 I. H. P., with tubulous or pipe boilers carrying 250 pounds of steam. The total weight of machinery in steaming condition will be about 12,000 pounds, or a horse power on 60 pounds of weight all told.

The machinery of the other two boats will be similar, except that it will develop only about 155 indicated horse power.

Hydraulic machinery has been designed for the monitors *Amphitrite*, *Monadnock*, and *Puritan*.

Pneumatic accumulators have been used with these designs for the reason that for the same capacity they are very much lighter, and, it is believed, less trouble will be experienced in keeping them in order when in actual use, since there are fewer joints, no pistons to be kept tight, and no condensed steam to be drained off as with steam accumulators. Air at a pressure of 600 pounds per square inch will be stored in a number of tanks secured under the deck; from these a pipe will lead to the accumulator and the air under pressure will be delivered on top of the water and the loss by absorption will be made up by a small air compressor located in the engine room.

A number of varieties of American semi-bituminous coal have been tested to determine their evaporative efficiency. These tests were made in a small marine boiler, and, as nearly as possible, under the conditions of actual use. Each test was continued for twenty-four hours at a rate of combustion of 12 pounds of coal per square foot of grate surface per hour, and the results obtained will be of great service to the Government in furnishing accurate knowledge of the steaming value of each of the different kinds.

Numerous tests have also been made at the expense of the parties interested of various devices intended for use with marine machinery.

NAVY-YARDS.

During the last year the machinery for the *Cincinnati* and *Raleigh*, with the exception of some of the piping, etc., which can not be fitted till the other parts are set up in place, has been practically completed, and most of it erected on board the vessels, on the former at the navy-yard at New York, and on the latter at Norfolk.

At the Mare Island yard the engines for the *Monadnock* are nearly completed and are set up in the shop, ready to be taken down and erected on board; the boilers are in place on the vessel.

New machinery for the *Nina* is being constructed at the New York yard, is well advanced, and will soon be ready for erection on board.

With the exception of the above, work under this Bureau at the various navy-yards has been the construction of machinery for small boats; repairs to naval vessels and preparing spare parts and outfits for them; installing new tools; setting up boilers removed from vessels and adapting them for shop use; constructing new boilers, and performing other work for other Bureaus as noted elsewhere, and in the care and preservation of plant and machinery.

Attention has frequently been called to the greatest defect in most of the shops of this Bureau, viz, the want of appliances for handling heavy weights. In many of the older buildings this can not be altogether rectified, as they were constructed with one or two rows of columns extending down the center, making the use of overhead traveling cranes impossible and necessitating the employment of pillar and locomotive cranes and trucks.

NAVY-YARD, PORTSMOUTH, N. H.

Work on the preservation or repair of the machinery of the following vessels has been performed during the year: *Fern*, *Kearsarge*, *Leyden*, and *Monongahela*.

Quite a number of engines and boilers for steam cutters have been completed.

Rough castings and forgings of similar machinery have been made and sent to the Naval Academy to be completed by the cadets for practice in shop work.

The following work has been done for other Bureaus:

Equipment.—Made coppers for galley, coal boxes, etc.

Construction and Repair.—Repaired boiler.

Yards and Docks.—Made castings for engine and boiler house; repaired buoys; made gas retorts, etc.

Ordnance.—Made small castings for deck sockets, etc.

The expenditures for the year other than for the machinery of naval vessels were as follows:

Civil establishment	$1,800.00
Superintendence and care and repair of shop, machinery, and tools	19,105.16
Improvement of plant	4,071.51
Care and repair of yard steam launches	1,220.66
Boilers and machinery for launches for general use	37,643.50
Labor and material for other departments	728.36
Breaking up old material	273.56
Miscellaneous	1,321.18
Total	66,163.93

NAVY-YARD, BOSTON, MASS.

Work has been done during the year on the machinery of the following vessels: *Concord*, *Enterprise*, *Fern*, *Illinois*, *Iwana*, *Passaic*, *Rocket*, and *Vesuvius*.

The expenditures during the year, other than for the machinery of naval vessels, were as follows:

Office expenses	$212.27
Care and repair of shop machinery and tools	2,032.85
Running, firing, repairing yard engines and boilers	480.29
Improvement of plant with new tools, etc	10,495.49
Care and repair of yard steam launches	415.91
Launch machinery for issue	6,991.23
Miscellaneous	531.07
Total	21,159.11

NAVAL STATION, NEWPORT, R. I.

Repairs have been made to the machinery of the *Richmond* and to the steam cutters attached to the station.

Considerable work has been done on the steam and water piping in the various buildings.

The expenditures have been as follows:

Care and repair of shop machinery and tools	$121.23
Repair of yard engines and boilers	685.19
Care and repair of yard steam launches	6,958.76
Miscellaneous	862.16
Total	8,627.34

NAVAL STATION, NEW LONDON, CONN.

No work has been done at this station other than that necessary for the preservation of material.

The expenditures have been as follows:

Care and repair of yard steam launches	$391.67
Miscellaneous	905.14
Total	1,296.81

NAVY-YARD, NEW YORK, N. Y.

During the last year repairs have been made to the machinery of the following vessels, or stores and outfits have been prepared for them: *Alarm, Atlanta, Baltimore, Bancroft, Bennington, Blake, Castine, Catalpa, Chicago, Cincinnati, Concord, Cushing, Detroit, Dolphin, Fern, Fortune, Iwana, Maine, Marblehead, Miantonomoh, Machias, Michigan, Minnesota, Montgomery, Nantucket, Narkeeta, Newark, New York, Nina, Philadelphia, Portsmouth, Puritan, Raleigh, San Francisco, Terror, Traffic, Vermont, Vesuvius, Wahneta*, and *Yorktown*.

The machinery for the *Cincinnati* and *Raleigh* is, so far as shop work is concerned, practically completed, and its installation on the vessels well advanced. In workmanship, in cost, and in appearance this machinery will compare favorably with that turned out by any establishment in the country, and the experience gained in its manufacture will be of great value to the Government.

Attention is again called to the insufficient size of the boiler shop, which is but half the length designed for it; also to the need of an erecting shop in place of the present temporary building serving for such.

Work has been done for other Bureaus as follows:

Construction and Repair.—Made a large number of castings of brass and iron; made numerous tests of materials.

Equipment.—Made a number of castings in brass and iron; repaired a number of dynamos and their engines on vessels; tested oils and other materials.

Ordnance.—Coppersmith work of various kinds; tested oils and other materials.

Supplies and Accounts.—Repaired boiler.

Yards and Docks.—Repaired boilers; made iron and brass castings.

The expenditures, other than for machinery of naval vessels, have been as follows:

Civil establishment	$9,261.19
Office expenses	1,385.07
Care and handling of stores	8,320.29
Care and repair of shop machinery and tools	19,200.24
Overhauling machine tools after the fire	18,413.00
Running and firing and repairing yard engines and boilers	4,549.67
Improvement of plant, new tools, etc	37,722.33
Repairs and maintenance of floating derrick	5,929.09
Care and repair of yard steam launches	8,544.22

Boilers and machinery of steam launches for issue	$8,357.28
Labor and material for other departments	836.00
Experimental and test purposes	7,141.40
Making stores for issue	3,379.36
Breaking up old material	299.20
Shipments	2,091.55
Holidays	9,640.07
Miscellaneous	5,648.29
Total	150,718.25

NAVY-YARD, LEAGUE ISLAND, PA.

Work in this yard has been the care and maintenance of the plant and a re-arrangement of the shops; slight repairs to and preservation of the machinery of the *Jason*, *Montauk*, *Nahant*, and a number of steam cutters.

A large engine lathe, a vertical milling machine, and an open side planer have been contracted for, to be paid from the appropriation to purchase tools for this yard; Act July 19, 1892.

The expenditures during the year, other than those for work done on naval vessels, were as follows:

Civil establishment	$1,200.00
Care and repair of shop machinery and tools	11,034.64
Care and repair of yard steam launches	586.68
Miscellaneous	1,420.49
Total	14,241.81

NAVY-YARD, WASHINGTON, D. C.

Repairs have been made to the machinery of the *Dale*, *Dolphin*, *Triton*, and *Wyandotte*.

Expenditures during the year, other than for the machinery of naval vessels, have been as follows:

Office expenses	$50.69
Laborer, Inspection Board for stores	596.40
Care and repair of shop machinery and tools	1,876.81
Care and repair of yard steam launches	697.38
Holidays	133.22
Blue-print apparatus at Bureau	924.16
Judge-Advocate-General's office	172.78
Total	4,451.44

NAVY YARD, NORFOLK, VA.

Work in the preservation or repair of the machinery, and preparing stores and outfits, has been performed for the following vessels: *Amphitrite*, *Atlanta*, *Bennington*, *Concord*, *Charleston*, *Dolphin*, *Detroit*, *Enterprise*, *Essex*, *Fern*, *Franklin*, *Mayflower*, *Newark*, *Phlox*, *Raleigh*, *San Francisco*, *Texas*, *Wahneta*, and *Wyandotte*.

A number of steam cutters have also been fitted with machinery.

Norfolk, from its location and climate, is admirably adapted for a building or repair station. It already has one of the finest ship-building plants in the country, but the shops and tools in the Steam Engineering department are not adapted to the building or extensive repairs of modern machinery, the principal deficiency being the want of boiler-making tools.

The expenditures during the year, other than for those on the machinery of naval vessels, have been as follows:

Civil establishment	$1,299.59
Drafting	1,621.44
Office expenses	2,986.67
Pay of writer for Employment Board	107.26
Care and handling of stores	3,171.24
Superintendence	5,339.49
Care and repair of shop machinery and tools	21,210.65
Running, firing, repairing yard engines and boilers	5,579.13
Care and repair of yard steam launches	790.97
Boilers and machinery of launches for issue	2,539.65
Labor and material for other departments	490.53
Experimental and test purposes	349.31
Breaking up old material	106.40
Holidays	2,482.02
Miscellaneous	872.84
Total	48,947.19

NAVAL ACADEMY, ANNAPOLIS, MD.

Necessary repairs have been made to the machinery of the steam launches and vessels attached to the academy.

NAVAL STATION, PORT ROYAL, S. C.

No work has been performed, except the care and repair of the machinery in steam cutters and the care and repair of the tools in the machine shop.

The expenditures have been as follows:

Care and repair of machine tools	$19.00
Care and repair of yard steam launches	423.69
Total	442.69

NAVY-YARD, PENSACOLA, FLA.

No work has been done at this yard during the year, except the care and preservation of the plant and machinery, and repairs to the machinery of steam cutters.

The expenditures have been as follows:

Civil establishment	$1,000.00
Office expenses	73.85
Care and handling of stores	513.92
Superintendence	1,224.00
Care and repair of shop machinery and tools	814.49
Running, firing, repairing yard engines and boilers	139.29
Care and repair of yard steam launches	449.28
Total	4,214.83

NAVAL STATION, KEY WEST, FLA.

No work other than the care and preservation of stores and machinery has been done at this station during the past year.

The expenditures have been as follows:

Superintendence	$1,584.00
Care and repair of shop tools	13.98
Repairing yard engines	11.16
Miscellaneous	2.32
Total	1,611.46

NAVY-YARD, MARE ISLAND, CAL.

During the past year repairs have been made to the machinery of the following vessels: *Alliance*, *Adams*, *Baltimore*, *Boston*, *Camanche*, *Charleston*, *Monterey*, *Mohican*, *Omaha*, *Ranger*, *San Francisco*, *Thetis*, *Yorktown*, *Ivy*, and *Nelly*.

Work on the new machinery for the *Monadnock* has made satisfactory progress.

Repairs were also made to the machinery of the revenue cutter *Corwin*, the expense being paid by the Treasury Department, and the cost was less than the price at which any private establishment in San Francisco would undertake the work. Repairs were also made to the *Patterson* and *Albatross* and the cost paid by the Coast Survey and the Commission on Fish and Fisheries.

Quite a large amount of work has been done for other Bureaus.

The expenditures, other than for repairs to machinery of naval vessels, have been as follows:

Civil establishment	$1,400.00
Drafting	3,537.08
Office expenses	2,323.89
Care and handling of stores	2,921.18
Superintendence	9,017.83
Care and repair of shop, machinery, and tools	24,746.01
Running, firing, repairing yard engines and boilers	6,961.05
Improvement of plant, with new tools, etc	15,502.18
Care and repair of yard steam launches	6,692.70
Boilers and machinery for new launches	423.14
Labor and material for other departments	4,133.88
Experimental and test purposes	94.24
Making stores for issue	4,705.91
Breaking up old material	332.04
Holidays	3,059.99
Miscellaneous	3,186.99
Total	89,038.47

PRESENT CONDITION OF THE MACHINERY OF NAVAL VESSELS, WITH THE WORK REQUIRED.

The following statement shows the condition of the machinery according to the latest reports, together with the work needed to fit the vessels for sea service or to keep them on duty or in readiness during the next fiscal year:

Adams (wooden cruiser).—Machinery and boilers in good condition. In commission.

Ajax (single-turret monitor).—In ordinary at Richmond, Va. Engines in fair condition. New boilers required for active service.

Alarm (torpedo ram).—In ordinary at Brooklyn navy-yard. Machinery and boilers in fair condition.

Alert (iron cruiser).—Main and auxiliary machinery in fair condition, but in need of extensive overhauling from long service. Boilers worn out and unfit for further use. Vessel in commission.

Alliance (wooden cruiser).—Machinery and boilers in good condition, having been recently overhauled at the Mare Island navy-yard. In commission.

Amphitrite (double-turret monitor).—In ordinary at the Norfolk navy-yard. Machinery and boilers in good condition. Sixty days required to fit engines for service.

Atlanta (second-rate steel cruiser).—Placed out of commission July 18 at the Norfolk navy-yard for thorough overhauling and repairs. Time required to fit for sea, one hundred and twenty days.

Baltimore (second-rate steel cruiser).—Main and auxiliary machinery and boilers in good condition. Recently overhauled at the New York yard. In commission.

Bancroft (Naval Academy practice vessel).—Machinery and boilers in good condition. In commission.

Bennington (steel gunboat).—Boilers and engines in good condition. In commission.

Boston (second-rate steel cruiser).—Engines, boilers, and auxiliary machinery in fair condition. In commission.

Camanche (single-turret monitor).—In ordinary at Mare Island navy-yard. Machinery and boilers in good condition and well cared for.

Canonicus (single-turret monitor). In ordinary at Richmond, Va. Engines in fair condition, but new boilers would be required for active service. Time needed to fit for temporary service, thirty days.

Catalpa (tug).—Machinery and boilers in fair condition. Yard tug at New York.

Catskill (single-turret monitor).—In ordinary at Richmond, Va. Engines in fair condition, but new boilers will be needed for active service. Time required to fit for temporary service, eight days.

Charleston (second-rate steel cruiser).—Repairs and thorough overhauling were completed in July at the Norfolk navy-yard. In commission.

Chicago (second-rate steel cruiser).—Engines in fair condition, but are much worn and in need of overhauling. Boilers in poor condition. Ship in commission.

Concord (steel gunboat).—Machinery and boilers have been lately overhauled at the Norfolk navy-yard and are in good condition. Vessel in commission.

Cushing (torpedo boat).—Machinery and boilers in good condition. In commission.

Detroit (steel cruiser).—Commissioned July 22, 1893. Machinery and boilers in good condition.

Dolphin (dispatch vessel).—Condition of machinery, good. Boilers show the result of long service and need constant attention. Vessel in commission.

Emerald (tug).—Machinery and boilers in fair condition. Yard tug at the Portsmouth navy-yard, New Hampshire.

Enterprise (wooden cruiser).—Detailed as school-ship for Massachusetts, and stationed at Boston. Engines and boilers in fair condition for service.

Essex (wooden cruiser).—Detailed for duty at Naval Academy. Machinery and boilers need extensive repairs and overhauling.

Fern (Government transport).—Engines and boilers are old, much worn, and only fairly efficient.

Fortune (tug).—Transferred to Ordnance Department for use at Newport, R. I. Engines and boilers in fair condition, and fit for the work required.

Franklin (wooden frigate).—Engines well cared for, but of obsolete type. Boilers poor and unserviceable. Employed as receiving ship at Norfolk navy-yard.

Hartford (wooden cruiser).—In ordinary at Mare Island navy-yard. Machinery and boilers obsolete and unfit for use.

Iroquois (wooden cruiser).—Machinery and boilers in poor condition, worn out, and obsolete. Hospital ship at Port Orchard, Puget Sound.

Ivy (tug).—Condemned and sold at Mare Island navy-yard.

Iwana (tug).—Machinery and boilers in good condition. Yard tug at Boston.

Jason (single-turret monitor).—In ordinary at League Island navy-yard. Main and auxiliary machinery in good condition. Boilers in need of extensive repairs. Time to fit for service, sixty days.

Kearsarge (wooden cruiser).—Engine and boilers in fair condition. In commission.

Lancaster (wooden cruiser).—Boilers and engines in fair condition, but of antiquated type and in need of overhauling. Ship in commission.

Lehigh (single-turret monitor).—In ordinary at Richmond, Va. Engines and boilers in good condition. Time required to fit for temporary service, ten days.

Leyden (tug).—Machinery and boilers in fair condition. Yard tug at the Portsmouth navy-yard, New Hampshire.

Mahopac (single-turret monitor).—In ordinary at Richmond, Va. Engines require a general overhauling. Boilers in fair condition. Time to fit for service thirty days.

Manhattan (single-turret monitor).—In ordinary at Richmond, Va. Engines in good condition, but the boilers are poor and need to be replaced before going into service. Thirty days required to fit for temporary service.

Marion (wooden cruiser).—Machinery, main and auxiliary, and boilers in good condition, but the boilers show signs of long service. In commission.

Miantonomoh (harbor-defense monitor).—Engines, main and auxiliary, and boilers in good condition. In commission.

Michigan (paddle steamer).—Recently fitted with new boiler, and machinery overhauled. In commission.

Minnesota (wooden frigate).—Receiving ship for boys at New York. Main engines in fair condition, but of obsolete type. The old boilers, still on board, are used for water tanks. New boilers for heating ship are in good condition.

Mohican (wooden cruiser).—Engines and boilers in good condition. In commission.

Monadnock (double-turret monitor).—Under construction at Mare Island navy-yard. Engines and boilers nearing completion.

Monocacy (iron paddle wheel).—Engines, boilers, and their details in fair condition. In commission.

Montauk (single-turret monitor).—In ordinary at League Island navy-yard. Machinery, main and auxiliary, and boilers in good condition. Seven days required to fit for temporary service.

Monterey (harbor-defense monitor).—Engine department in good condition. In commission.

Nahant (single-turret monitor).—In ordinary at League Island navy-yard. Machinery in fair condition. Boilers poor. Time required to fit for temporary service, fourteen days.

Nantucket (single-turret montior).—Turned over to naval militia of North Carolina. Machinery in condition for temporary service.

Narkeeta (tug).—Boilers and engines in good condition. Yard tug at the New York navy-yard.

Newark (second-rate steel cruiser).—Machinery and boilers in good condition. In commission.

Nina (tug).—Machinery and boilers nearly worn out. Yard tug at New York navy-yard. New machinery is now being constructed.

Nipsic (wooden cruiser).—Engines and boilers worn out and unfit for further service. Guard ship at Port Orchard, Puget Sound.

Omaha (wooden cruiser).—In ordinary at Mare Island navy-yard. Machinery obsolete. Boilers worn out.

Passaic (single-turret monitor).—In ordinary at the Boston navy-yard. Machinery and boilers in fair condition.

Pensacola (wooden frigate).—In ordinary at navy-yard, Mare Island. Engines and boilers obsolete, but in fair condition.

Petrel (steel gunboat).—Engines in good condition. Condenser needs re-tubing. Boilers require constant attention. In commission.

Philadelphia (second-rate steel cruiser).—Recently overhauled. Engines and boilers in good condition. Ship in commission.

Pinta (armed tug).—Machinery and boilers in fair condition. In commission.

Puritan (double-turret monitor).—In ordinary at the Brooklyn navy-yard. Important parts of main engines in good condition. Time required to fit for sea service, sixty days.

Ranger (iron cruiser).—Engines and boilers in good condition. Vessel in commission.

Richmond (wooden cruiser).—Machinery well cared for and boilers in fair condition. Employed as receiving ship at Newport, R. I.

San Francisco (second-rate steel cruiser).—Engines and boilers in good condition. Ship in commission.

Standish (Naval Academy target-practice boat).—Engines and boilers about worn out. In commission.

Swatara (wooden cruiser).—In ordinary at Mare Island navy-yard. Engines and boilers worn out.

Terror (double-turret monitor).—In ordinary at Brooklyn navy-yard. Machinery and boilers in good order. Time estimated to fit for sea, one hundred and fifty days.

Thetis (special-service vessel).—Engines and boilers in fair condition. In commission.

Triton (tug).—Machinery and boilers in fair condition. Yard tug at Washington.

Vesuvius (dynamite cruiser).—Machinery and boilers in good condition. In commission

Wabash (wooden frigate).—Machinery obsolete, worn out, and condemned. Used as receiving ship at the Boston navy-yard.

Wahneta (tug).—Boilers and machinery in good condition. Yard tug at Norfolk

Wyandotte (single-turret monitor).—In ordinary at Norfolk navy-yard. Engines and boilers in fair condition.

Yantic (wooden gunboat).—Machinery and boilers in fair condition, but of obsolete type. In commission.

Yorktown (steel gunboat).—Engines and boilers recently overhauled at the New York navy-yard and are in good condition.

Cost of work done under cognizance of Bureau of Steam Engineering for fiscal year ending June 30, 1893, upon machinery, boilers, etc., with outfits, stores, etc., of naval vessels.

Name of vessel.	Machinery, boilers, etc.	Outfits, stores, etc.	Total.
Adams	$3,265.51	....	$3,265.51
Ajax and monitors	20.65	$53.63	74.28
Alarm	680.01	....	680.01
Alert	....	936.43	936.43
Alliance	5,868.68	1,526.98	7,395.66
Amphitrite	4,315.11	....	4,315.11
Atlanta	26,098.19	1,241.99	27,340.18
Baltimore	17,102.53	....	17,102.53
Bancroft	2,877.99	216.33	3,094.32
Bennington	8,505.99	3,338.83	11,844.82
Boston	1,135.36	905.41	2,040.77
Brooklyn *	2,180.50	....	2,180.50
Camanche	187.17	....	187.17
Castine	1,245.21	1,216.02	2,461.23
Catalpa	306.89	....	306.89
Charleston	10,936.31	181.28	11,117.59
Chicago	23,019.30	1,883.37	24,902.67
Cincinnati	167,254.97	....	167,254.97
Columbia*	2,897.18	....	2,897.18
Concord	18,057.19	1,212.79	19,269.98
Constitution	133.71	....	133.71
Cushing	449.05	549.82	998.87
Dale	127.00	....	127.00
Detroit	1,070.93	468.84	1,539.77
Dolphin	4,179.61	140.49	4,320.10
Emerald	1,220.66	....	1,220.66
Enterprise	189.60	121.20	310.80
Essex	69.08	592.99	662.07
Fern	1,402.04	31.94	1,433.98
Fortune	98.26	....	98.26
Franklin	1,273.05	104.53	1,377.58
Indiana*	879.69	....	879.69
Iowa*	1,673.03	....	1,673.03
Ivy	75.42	....	75.42
Iwana	2,482.41	40.66	2,523.07
Jason	554.88	....	554.88
Katahdin *	1,020.38	....	1,020.38
Kearsarge	2,274.71	487.38	2,762.09
Lancaster	....	3,095.83	3,095.83
Leyden	116.78	....	116.78
Machias	944.67	1,243.59	2,188.26
Maine	6,057.39	717.17	6,774.56
Marblehead *	279.62	....	279.62
Marion	37.41	798.58	835.99
Massachusetts	1,540.02	....	1,540.02
Mayflower	110.80	....	110.80
Miantonomoh	8,476.28	96.89	8,573.17
Michigan	8,588.72	869.33	9,458.05
Minneapolis *	$604.02	....	$604.02
Minnesota	2,386.56	$38.65	2,425.21
Mohican	10,619.91	567.80	11,187.71
Monadnock	53,805.37	....	53,805.37
Montgomery	886.77	473.08	1,359.85
Monocacy	24.50	300.41	324.91
Monongahela	716.50	5.98	722.48
Montauk	596.32	....	596.32
Monterey *	1,013.93	....	1,013.93
Nahant	773.92	....	773.92
Narkeeta	4,353.35	....	4,353.35
Nantucket	953.04	....	953.04
Nellie	2,131.02	....	2,131.02
Newark	5,507.57	49.32	5,556.89
New York	3,224.88	514.50	3,739.38
Nina	17,389.22	....	17,389.22
Olympia *	1,480.19	....	1,480.19
Omaha	61.12	....	61.12
Oregon *	1,270.51	....	1,270.51
Palos	58.58	....	58.58
Passaic	736.43	....	736.43
Petrel	286.44	1,047.69	1,334.13
Philadelphia	8,444.63	1,074.39	9,519.02
Phlox	....	142.47	142.47
Pinta	....	108.65	108.65
Portsmouth	130.42	....	130.42
Puritan	7,813.28	....	7,813.28
Raleigh	136,845.38	....	136,845.38
Ranger	3,617.88	32.02	3,649.90
Richmond	538.68	905.85	1,444.53
Rocket	216.29	....	216.29
San Francisco	5,057.54	2,062.30	7,119.84
St. Louis	101.64	....	101.64
Standish	308.50	297.46	605.96
Terror	24,612.14	....	24,612.14
Texas*	1,596.75	....	1,596.75
Thetis	6,120.14	182.97	6,303.11
Traffic	439.47	....	439.47
Triton	434.42	306.43	740.85
Vermont	611.12	194.49	805.61
Vesuvius	1,726.78	112.26	1,839.08
Wabash	20.59	....	20.59
Wahneta	1,019.36	45.80	1,065.16
Wyandotte	424.57	....	424.57
Yantic	....	798.68	798.68
Yorktown	13,943.68	724.01	14,667.64
Aggregate	664,192.35	32,057.51	696,249.86

For copyists and draftsmen.

MACHINERY UNDER CONSTRUCTION FOR NEW VESSELS.

The state of work on the machinery of the vessels reported upon in my last annual report is as follows:

Bancroft.—Machinery completed and successfully tried; vessel delivered to the Government and now in use as a practice ship at the Naval Academy, Annapolis, Md.

Detroit (formerly cruiser No. 10).—Machinery completed and successfully tried; vessel delivered to the Government and is now in commission.

Machias (formerly gunboat No. 5).—Machinery completed and successfully tried; vessel delivered to the Government, and is now in commission.

Castine (formerly gunboat No. 6).—Building at the Bath Iron Works, Bath, Me. The machinery of this vessel is a duplicate of that fitted to the *Machias*. She has recently been given a very successful official trial, making slightly over 16 knots.

Monterey.—Vessel now in commission; built by the Union Iron Works, San Francisco, Cal., and finally accepted by the Government June 22, 1893, subject to certain reservations. This vessel was given her official trial on January 5, 1893, and although the average indicated horse power expected (5,400) was not maintained successfully for four consecutive hours, as required by the contract, the machinery worked smoothly and satisfactorily. The four Ward coil boilers fitted in this ship gave no trouble, and the Trial Board expressed the opinion that this type of boiler was well adapted to form the major part of the boilers in vessels of war.

New York.—Machinery completed and successfully tried: vessel delivered to the Government and now in commission.

Maine.—Hull under construction at the navy-yard, New York; the machinery, built by N. F. Palmer, jr., & Co., of New York, is now erected, and all auxiliaries are in place on board the vessel. The machinery was given a successful dock trial on July 21 and 22. Some small unimportant items of work, such as piping to berth-deck blowers, steam winches, steam-heater piping, parts of hydraulic plant, engine-room telegraphs, etc., are yet to be finished.

Texas.—The machinery of this vessel is being built and erected on board by the Richmond Locomotive and Machine Works of Richmond, Va.; hull under construction at the navy-yard, Norfolk, Va. The boilers and engines, including auxiliaries, are practically completed and in position in the ship; work is now in progress completing air ducts, engine-room and boiler-room platforms and ladders, and various small gear about the machinery.

Indiana (coast line battle ship No. 1).—Building by The William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa.

The machinery of the vessel is about 95 per cent. finished and in place. There yet remains various engine and fire-room fittings and minor valves and pipes to finish.

Massachusetts (coast line battle ship No. 2).—Building by The William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa.

The machinery of this vessel is a duplicate throughout of that for the *Indiana*, though it is not so far advanced. The main and auxiliary boilers are finished and in place, and the mountings and fittings well under way. The bearings are nearly all in place on board and the engine frames are ready. The main cylinders are ready for testing. The shafting is finished and the principal working parts of main engine about nine-tenths finished.

Oregon (coast line battle ship No. 3).—Building at Union Iron Works, San Francisco, Cal.

The machinery for this vessel is about 85 per cent. finished, and about 5 per cent. is in place in the ship. The main engines are ready for erecting. The main and auxiliary boilers are finished and are having uptakes and attachments fitted. The piping and general fittings are well under way.

Brooklyn (armored cruiser No. 3).—Building by The William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa.

Very little progress has been made on the machinery of this vessel beyond a number of approved drawings and a few of the minor castings.

Iowa (seagoing battle ship No. 1).—Building by William Cramp & Sons, Philadelphia, Pa.

Practically no work has been done on the machinery of this vessel, with the exception of a number of approved drawings.

Olympia (cruiser No. 6).—Building at the Union Iron Works, San Francisco, Cal.

The propelling and auxiliary machinery is all in place. The turret-turning machinery is under way, but little of it is yet in the machine shop. The ship has been under way three times; the last for five hours with steam on four main boilers, the maximum revolutions being 132. Everything is now being stripped and examined and being made ready for another trial. The contract time has been extended on this vessel from April 1, 1893, to January 1, 1894.

Cincinnati (cruiser No. 7).—Machinery building at the New York navy-yard.

The main engines are erected in the ship with all shaftings and bearings. The boilers are completed, tested, and secured in place. The condensers, air, circulating and feed pumps and blowers are in place. There is yet considerable work to be done on piping and boiler connections. The machinery is about nine-tenths finished.

Raleigh (Cruiser No. 8.)—Machinery built at the navy-yard, New York, and is being put in the ship at the Norfolk navy-yard.

The erection is about 90 per cent completed, there remaining yet only the piping and minor details.

Montgomery (formerly Cruiser No. 9).—Building by the Columbian Iron Works and Dry Dock Company of Baltimore, Md.

The machinery is complete, and erected on board the vessel ready for making steam trials; the engines have been in operation with the vessel secured to the dock, and one unofficial trip has been made in Chesapeake Bay. It is expected that this ship will be ready for her official trial in a short time.

Marblehead.—Hull built by the assignees of Harrison Loring at the City Point Works, Boston, Mass.; machinery by N. F. Palmer, jr., & Co., New York. The details of the propelling engines and all auxiliaries for the vessel have been completed and erected on board. Steam has been raised on one of the auxiliary boilers, and most of the auxiliary machinery tried under steam. Work is now in progress preparing the vessel for her official trial, which is expected to take place in a short time.

Columbia (formerly Cruiser No. 12).—Building by The William Cramp & Sons Ship and Engine Building Company of Philadelphia, Pa.

The machinery of this vessel, including auxiliaries, has been completed and installed on board ship. Some minor details remain to be finished, such as galleries and platforms in engine and fire rooms, floor plates, lubricating gear, parts of auxiliary piping, etc., which must of necessity be left until the last moment. Several dock trials have taken place and one preliminary unofficial trial at sea. It is expected that the ship will be given her official trial about the 1st of November.

Minneapolis (formerly Cruiser No. 13).—Building by The William Cramp & Sons Ship and Engine Building Company, Philadelphia, Pa.

The main engines are practically finished, and the engines are now assembled in the shops for adjustment before being placed on board; the main and auxiliary boilers are completed, and work of placing them in position in the ship is in progress; main and auxiliary condensers are completed and installed; also distillers, evaporators, feed tanks, main circulating pumps and auxiliary pumps. The construction of the machinery of this vessel has proceeded very rapidly, and the work has been much facilitated by the use of drawings, patterns, etc., made for building the machinery of the *Columbia*, a sister ship.

Ericsson (Torpedo boat No. 2).—Building by the Iowa Iron Works, Dubuque, Iowa.

The contract time for the delivery of this vessel to the Government has long since expired, and it will probably be several months yet before she is ready for trial. Work on the machinery is now about 80 per cent. finished; the engines are being assembled in the shop, and most of the details are in place; the drums of boilers have been riveted up, and all tubes cut to size; various openings for valves, pipes, etc., have been cut, and work of assembling the different parts is in progress.

Katahdin (Harbor Defense Ram No. 1).—Building by the Bath Iron Works, Bath, Me.

The machinery of this vessel, now about 75 per cent. finished, is much behind the time allowed for completion, but during the past few months the progress has been more satisfactory than heretofore; the engines are almost completed, and are assembled in the machine shop for adjustment; boilers are completed, and are being secured in position on board the ship; many of the auxiliaries are in place, and the piping is being installed.

Monadnock.—Building at the navy yard, Mare Island, Cal.

The main engines are complete and are erected in the shop. Their attachments, accessories, auxiliary machinery, etc., are well under way. The boilers are in place in the vessel and many of their fittings secured. The pedestals for line shaft pillow blocks are being secured. Steam pumps for engine and fire rooms are in their respective compartments and secured. The valves and piping are well under way. Generally speaking, the machinery is about 90 per cent. finished and 15 per cent. in place.

CONTRACT TRIALS OF NEW VESSELS.

Since my last report six of our new vessels have been subjected to the official trials, and all have satisfactorily fulfilled the contract requirements except the *Monterey*, which is somewhat short of the required horse power. She was the only vessel where the contract required a given horse power, the others all being "speed" ships.

The *Bancroft* was tried by the "standardized screw" method, which consists in first subjecting the vessel to a series of progressive trials on the measured mile in order to determine for all speeds the relation of revolutions and speed; and then having a straightaway run for four hours at sea or in any convenient locality. The results with the *Bancroft* were highly satisfactory, and incidentally the progressive trials furnished data of the relation of speed and horse power which will be very useful in future designs.

The *Detroit* and *Machias* were tried over a measured course of about 30 knots in Long Island Sound, and the *New York* over a measured course of about 40 knots in the Atlantic, off the New England coast. All of these trials were highly successful.

The trial of the *Monterey* was of unusual interest, owing to this vessel being the first to be fitted with a number of large coil boilers. On the advice of this Bureau the Department, more than five years ago, decided to give boilers of this type a thorough test by using them for

the greater part of the steam-generating plant of the *Montere*
account of the special service for which this vessel is intended-
defence—coil boilers are specially adapted, both from their lig
and the rapidity with which steam can be safely raised.

On the official trial of the *Monterey* these boilers gave great
faction, carrying both steam and water with fair uniformity, an
ing through the trial without the slightest mishap or leak of an

That the horse power was not steadily maintained was due
ficient firing, the officer who was on duty in the fire room rem
"It is my opinion that the firing was not such as to accompl
best results; there appeared to be little personal interest amo
firemen as to success or failure." The power was maintained
that required for about an hour and three-quarters, and then fel

It is to be noted that the supply of firemen on the Pacific
limited, and few of them have experience with forced draft. Th
be no doubt that, with men of greater experience, the trial woul
been a success in every way.

The trial demonstrated one thing conclusively—the ease and s
tion of working coil boilers "in battery" and in conjunction with
of ordinary type. Previous experience was confirmed that these
will stand any amount of "forcing" without injury.

One point remains to be settled before these boilers are adop
almost exclusive use—durability. This can only be determi
actual experience, and that will be furnished by the cruise of th
terey. If the experience there is satisfactory, there can be n
that we can use coil boilers for almost the entire boiler power
vessels, with great saving in weight. This will permit of a
coal supply in cruisers, and of heavier armor, more coal, or
guns in battle ships.

Two years ago the Bureau secured data of the coal consump
the full-power trials of some of our ships, which were the first
of the kind ever obtained. Continuing its efforts to secure this
information, the *New York*, on her return from the four hour
trial, was given an eight hour coal-consumption trial, with th
engine on each shaft only and four out of the six main boilers w
under natural draft.

The contractors for the machinery of the *Maine* having comple
machinery, but being unable to have a sea trial owing to the
pleteness of the hull due to non-delivery of armor, requested
trial to demonstrate the satisfactory performance of the machi
order that they might receive a portion of the money remaini
them. Each engine with half the boilers was tried separately
hours, the requirement being that full-boiler pressure should be
and a mean pressure, reduced to the low pressure-cylinder of
30 pounds, be maintained. The trials were entirely successful i
way.

The *Castine* has just completed her official trial with marked s
but too late for the data of the trial to be inserted in this repor

Three other vessels have had preliminary trials by the cont
the *Columbia*, the *Olympia*, and the *Montgomery*. These preli
trials have all given satisfaction, and assure the successful com
of the official trials.

The results of these trials, in detail, are given in the following

Full power forced draft contract trials of

1	Name of vessel		MONTEREY		BANCROFT	
2	Date of trial		January 5, 1893		January 26, 1893	
3	Duration of trial (during which data were taken).		4 hours		4 hours	
4	Place of trial		San Francisco Bay		At sea off end of Long Island.	
5	Condition of weather		Smooth sea; light breeze		Smooth sea; light breeze	
6	Length on load water line, feet and inches.		256′ 0″		187′ 6″	
7	Beam, feet and inches		59′ 0.5″		32′ 0″	
8	Mean draft on trial, feet and inches		14′ 5″		11′ 5¼″	
9	Displacement on trial, tons		4,000		832	
10	Immersed midship section on trial, square feet.		772		277	
11	Coefficient of fineness, prismatic		.643		.425	
12	Type of engine		Vertical triple expansion.		Vertical triple expansion	
13	Cylinder, diameters in inches.	High pressure	27		13.5	
14		Int. pressure	41		21.0	
15		Low pressure	64		31.0	
16	Stroke of pistons, inches		30		20.0	
17	Number and type of boilers		2 cylindrical single ended; 4 Ward coil.		2 low cylindrical	
18	Length and diameter of boilers, feet and inches.		Cylindrical, 10′ 7″; 11′ 2″; Ward, 12′ 4″ height, 10′ 8″ diameter.		17′ 0″; 8′ 9.5″	
19	Number and diameter of furnaces in each.		Cylindrical, 2 42″; Ward, annular grate; 10′ 2″, external diam.; 3′ ¾″ internal diam.		2; 30″	
20	Total grate surface used on trial, square feet.		383.24		87.75	
21	Total heating surface used on trial, square feet.		14,785.1		2,646.60	
22	Total condensing surface used on trial, square feet.		7,717.4		1,824.00	
23	Screw propeller.	diameter, feet and inches	10′ 2″		7′ 0″	
24		mean pitch on trial, feet and inches.	11′ 8″		7′ 9″	
25		mean pitch adjustable between, feet and inches.	11′-3″ to 13′-3″		6′ 9″ to 8′ 3″	
26		developed area (both screws), square feet.	77.76		30.00	
27		number of blades	3		3	
28	Steam pressure in boilers (per gauge), pounds.		155		167.6	
			Starboard.	Port.	Starboard.	Port.
29	Steam pressure at engines (per gauge) pounds.		153.0	148.6	163.0	163.1
30	Steam pressure first receiver (absolute) pounds.		72.2	68.3	64.3	65.8
31	Steam pressure second receiver (absolute) pounds.		29.7	29.5	24.1	25.8
32	Vacuum in condensers, inches of mercury.		26.6	26.2	26.3	
33	Revolutions of main engines per minute.		162.86	161.17	223.09	221.77
34	Mean pressures in pounds per square inch.	High pressure	52.55	54.96	61.98	65.87
35		Intermediate pressure.	23.32	22.73	21.77	22.93
36		Low pressure	12.85	12.61	13.98	12.48
37		Aggregate equivalent on low-pressure.	31.53	31.60	34.61	35.28
38	Indicated horse power.	High pressure	734.43	760.18	197.00	208.04
39		Intermediate pressure.	748.21	731.22	169.09	176.52
40		Low pressure	1,021.26	991.56	222.33	210.36
41		Aggregate each main engine.	2,503.90	2,482.96	588.42	594.92
42		Aggregate both main engines.	4,986.87		1,183.34 5.09	
43		Air pumps	18.37	18.16	1.35	
44		Circulating pumps	22.37	26.00	1.70	
45		Feed pumps	32.28		12.00	
46		Blowers	83.91		9.50	
47		Other auxiliaries	55.96			
48		Aggregate mean of all machinery.	5,243.92		1,212.98	
49		Aggregate maximum of all machinery.	5,553.54		1,270.46	

twin-screw steel vessels of U. S. Navy.

DETROIT		NEW YORK		MACHIAS		1
April 17, 1893		May 22, 1893		June 10, 1893		2
3 hours 47.5 minutes		3 hours 57.8		3 hours 56.3 minutes		3
Long Island Sound		At sea, off coast of New England, between Cape Ann and Cape Porpoise.		Long Island Sound		4
Smooth sea; moderate breeze.		Moderate breeze and sea		Smooth sea; moderate breeze		5
257' 0''		380' 0''		190' 0''		6
37' 0''		64' 3''		32' 0''		7
14' 5¾''		23' 10¼''		12' 0¾''		8
2,068		8,480		1,067.50		9
468		1,350		324.6		10
.526		.509		.512		11
Vertical triple expansion		Vertical triple expansion: two engines on each shaft.		Vertical triple expansion		12
26.5		32		15.75		13
39.0		47		22.50		14
63.0		72		35.00		15
26.0		42		24.00		16
3 double ended; 2 single ended.		6 double ended; 2 single ended		2 marine locomotive		17
2 D. E., 18' 1''; 11' 8''; 1 D. E., 18' 3½''; 11' 8''; 2 S. E., 9' 0½''; 11' 8''.		D. E., 18' 0''; 15' 9''; S. E., 8' 6''; 10' 0''.		18' 6''; 9' 3''		18
Double ended, 4; 42''; single ended, 2; 42''.		Double ended, 8; 39''; single ended, 2; 33''.		6' 9'' long 2; 44'' to 54'' wide.		19
367.95		1,051.96		120.0		20
10,978.10		32,957.80		4,590.00		21
7,652.00		22,240.00		2,246.00		22
11' 0''		16' 0''		7' 8''		23
13' 0''		21' 0''		8' 10.3''		24
12' 0'' to 15' 0''				8' 4.6 to 9' 4''		25
58		128.18		30.88		26
3		3		3		27
170.7		175.7		163.2		28
Starboard.	Port	Starboard.	Port.	Starboard	Port.	
164.0	162.7	168.6	169.9	159.5	161.7	29
80.9	76.7	70.0	68.7	91.2	106.2	30
26.8	27.9	27.5	27.6	34.7	36.6	31
25.1	25.4	25.3	25.5	25.7		32
170.1	170.1	134.65	135.00	218.55	214.27	33
60.20	63.35	F. 59.1 A. 61.1	F. 58.6 A. 57.5	48.35	45.28	34
34.30	31.90	F. 28.6 A. 28.1	F. 28.4 A. 27.4	23.48	27.88	35
13.85	13.65	F. 13.6 A. 13.8	F. 12.6 A. 12.9	14.72	16.69	36
37.67	37.08	37.4	35.85	33.93	37.03	37
731.13	705.17	F. 1,328.03 A. 1,372.86	F. 1,318.78 A. 1,295.27	245.56	224.45	38
908.22	842.72	F. 1,398.73 A. 1,369.46	F. 1,392.09 A. 1,342.46	215.55	186.60	39
960.13	974.50	F. 1,568.33 A. 1,598.24	F. 1,459.77 A. 1,503.27	276.11	415.82	40
2,599.48	2,551.79	F. 4,295.09 A. 4,340.56	F. 4,170.64 A. 4,141.00	86[illegible].5	[illegible].91	41
5,154.27		16,947.29		1,794.19		42
19.83	18.94	22.26	16.48	17.94		
5.32	4.17	20.00	19.48	1[illegible]		43
4.94		49.53		19.7[illegible]		44
18.94		2[illegible]6.24		23.90		45
0.73		[illegible].17		2.30		46
						47
5,227.14		17,1[illegible]1.42		1,873.41		48
5,435.94		17,[illegible]5.87		1,963.40		49

Full power forced draft contract trials of

		Starboard.	Port.	Starboard.	Port.
50	Speed per hour in knots	13.6		14.37	
51	Slip of propeller, per cent	27.47	26.73	15.75	15.25
52	Indicated thrust (of main engines only) per square foot of developed area of propeller, pounds.	1,115.1	1,117.4	748.7	761.4
53	I. H. P. per square foot of grate, based on mean I. H. P.	13.68		13.82	
54	Heating surface per I. H. P., based on mean I. H. P.	2.81		2.18	
55	Condensing surface per I. H. P., based on mean I. H. P.	1.46		1.54	
56	Weight of propelling machinery (including water), tons.	403.4		124.46	
57	I. H. P. per ton of machinery (mean I. H. P.).	13.00		9.75	
58	I. H. P. per ton of machinery (maximum I. H. P.).	13.77		10.21	
59	Kind and quality of coal used	No record.		Pocahontas; excellent.	
60	Total coal burned per hour, pounds	No record.		*3,071.00	
61	Refuse from coal per hour, pounds	No record.		134.00	
62	Coal per hour per square foot of grate surface, pounds.	No record.		35.00	
63	Coal per hour per I. H. P., pounds	No record.		2.53	

* Estimated.

twin-screw steel vessels of U. S. Navy.—Continued.

Starboard.	Port.	Starboard.	Port.	Starboard.	Port.	
18.71		21.00		17.46		50
14.25	14.25	24.73	24.95	[illegible]	17.44	51
1,337.8	1,314.8	1,458.71	1,400.33	957.6	[illegible]	52
14.21		16.54		15.61		53
2.10		1.89		2.45		54
1.46		1.35		1.29		55
462.92		1,529.5		156.27		56
11.29		11.37		11.98		57
11.74		11.53		12.56		58
Pocahontas: excellent		Pocahontas; hand picked.		Pocahontas: hand picked.		59
No record.		No record.		14,569.00		60
No record.		No record.		200.00		61
No record.		No record.		38.08		62
No record.		No record.		2.44		63

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[1] Shipped in bags of 100 pounds each.

Dock trial of machinery of U. S. S. Maine.

Cylinder diameters in inches	High pressure	35.5	
	Intermediate pressure	57.0	
	Low pressure	88.0	
Stroke of pistons, inches		36	
Type of boilers		Cylindrical; single-ended.	
Number of boilers		8	
Length and diameter of boilers, feet and inches		10′ 0″; 14′ 0″	
Number and diameter of furnaces in each		3; 42″	
Total grate surface, square feet		573.84	
Total heating surface, square feet		19,015.36	
Total condensing surface, square feet		14,020.00	
Screw propeller	Diameter, feet and inches	14′ 6.″5	
	Mean pitch, feet and inches	16′ 1″	
	Developed area (one screw) square feet	65.5	
	Number of blades	4	
		Starboard.	Port.
Place of trial		New York navy-yard.	
Date of trial		July 21, 1893	July 22, 1893
Grate surface in use, square feet		286.92	286.92
Heating surface in use, square feet		9,507.68	9,507.68
Condensing surface in use, square feet		7,010.00	7,010.00
Duration of trial in hours		4	4
Air pressure		Natural draft.	
Steam pressure in boilers (per gauge), pounds		140.5	140.7
Steam pressure at engine (per gauge), pounds		138.2	139.0
Steam pressure first receiver (absolute), pounds		65.1	67.4
Steam pressure second receiver (absolute), pounds		29.1	35.3
Vacuum in condenser, inches of mercury		25.6	25.0
Revolutions per minute		82.6	81.7
Mean pressures in cylinders	High pressure	56.19	55.75
	Intermediate pressure	18.36	20.45
	Low pressure	15.35	13.00
	Equivalent on low pressure	32.12	30.65
Indicated horse power	High pressure	822.20	807.05
	Intermediate pressure	699.20	770.55
	Low pressure	1,398.60	1,179.66
	Aggregate for the main engine	2,920.00	2,757.26
	Air and circulating pumps	29.63	23.68
	Feed pumps (estimated)	5.50	5.00
	Total	2,955.13	2,785.94
Coal (Pocahontas) per hour, pounds		5,992.00	5,376.00
Coal (Pocahontas) per hour, per I. H. P., pounds		2.03	1.93
I. H. P. per square foot of grate surface		10.3	9.7

Eight-hour coal consumption trial of U. S. S. New York.

Date of trial		May 24, 1893.	
Place of trial		At sea en route to Delaware Bay.	
Wind		On the bow, force 5.	
Sea		On the bow, moderate.	
Mean draught		22 feet 3 inches.	
Displacement		7,700 tons.	
Immersed midship section		1,230 square feet.	
Boilers in use		4	
Grate surface		658.64	
Heating surface		20,670.10	
Natural draft.			
Average speed by patent log		15.73 knots.	
Slip of propellers (mean)		16.53 per cent.	
Steam at boilers (per gauge)		135.5	
		Starboard.	Port.
Steam at engines		134.4	131.9
Steam in first receiver (absolute)		44.1	44.9
Steam in second receiver (absolute)		17.4	19.7
Vacuum in main condensers in inches of mercury		26.	25.
Vacuum in auxiliary condensers		3.7	3.4
Cut-off	High pressure	.70	
	Intermediate pressure	.71	
	Low pressure	.71	
Revolutions		90.5	91.2
Throttles, tenths		1.	1.
Mean effective pressure	High pressure	48.3	45.8
	Intermediate pressure	20.6	27.
	Low pressure	10.6	10.1
I. H. P.	High pressure	732.2	698.84
	Intermediate pressure	680.62	689.28
	Low pressure	828.75	793.10
Total I. H. P. each engine		2,241.57	2,181.22
Total I. H. P. both main engines		4,422.79	

Eight-hour coal consumption trial of U. S. S. New York—Continued.

Air pumps	9.59	4.53
Circulating pumps	10.62	7.37
Collective I. H. P. each main engine, air and circulating pumps	2,261.78	2,193.12
Collective I. H. P. both main engines, air, and irculating pumps	4,454.90	
Horse power of other auxiliaries in use	157.43	
Total horse power of all machinery in use	4,612.33	
Kind and quality of coal used	Picked Pocahontas.	
Net weight in pounds of fuel burned per hour	9,592	
Pounds of fuel per I. H. P. per hour	2.08	
Pounds of fuel per square foot G. S. per hour	14.56	
I. H. P. per square foot of G. S.	7.00	
H. S. per I. H. P	4.48	

It may not be out of place to recall the fact that when, a few years ago, foreign governments were reducing the weight of machinery in their ships, a favorite method, and the one which effected the greatest reduction, was to reduce the size of the boiler, making the gases from the several furnaces (as many as eight in large double-ended boilers) debouch into a common combustion chamber, and by using very strong forced draft get an indicated horse power on trial which so weakened the boilers, and produced so much leakage around the tubes, as to make the boilers almost worthless before beginning service. This type of boiler is one which this Bureau has constantly opposed as being unfit for naval vessels and unsuited to the purposes of forced draft. The type adopted by the Bureau is one which long experience had shown to be efficient and capable of withstanding hard usage, and it is a source of great satisfaction to know that in the trials of our new ships the boilers have stood the strain admirably, and that in service they have proved highly satisfactory. To such an extent had the former design been carried in England, with attendant leakage and unreliability of the boilers, that it was deemed necessary to appoint a committee of engineers to "consider existing types and designs of propelling machinery and boilers," and to make suggestions for their improvement.

The report of this committee, recently published, recommends a type of boiler almost identical with that which this Bureau has been designing. The committee likewise recommends certain apparatus connected with the feeding and the circulation of water in the boilers which has always been required in our machinery specifications. I deem this statement of the trials of our foreign brethren justified, in view of the statements which were so loudly expressed at one time, that our machinery was too heavy, that we were putting 30 per cent more weight in our boilers than were the English, and similar statements calculated to discredit the work of this Bureau. In the light of the sad experience which that type of boiler has had, it looks as if we had put the weight where it was most needed, for we have not been compelled to resort to any makeshifts, however ingenious they may be, to carry our ships through their trials.

PERSONNEL.

There are at this date one hundred and eighty commissioned officers on the active list of the engineer corps of the Navy, viz: seventy chief engineers, sixty-six passed assistant engineers and forty-four assistant engineers. There are in addition eleven engineer naval cadets, of whom one is in Paris studying naval architecture with the expectation of being commissioned an assistant naval constructor, and ten are at sea performing the service required by law prior to their final graduation from the Naval Academy. Four of these young gentlemen will become assistant engineers in June, 1894, and six a year later. Their duties in their present grade are not of a definite nature but consist principally in study and such minor duties as may be assigned them. Seven assistant engineers commissioned in July of this year, are receiving instruction intended to supplement the academy course and to better fit them for their duties as engineers. From the above number must be taken those who are sick, those on the customary leave of absence at the end of a cruise, and those unavailable from other causes, leaving a number entirely inadequate to the existing and rapidily increasing requirements, and unless something is soon done, our Navy, now practically an engineering one, will be crippled for want of engineers,

This question of the sufficiency of engineers in the service is one of paramount importance, and no other, if left in abeyance, will so vitally affect the efficiency of the Navy as a fighting organization. It must be remembered that the efficiency of the modern war ship, either as a fighting machine or as a commerce destroyer, depends wholly and absolutely upon her machinery, and the efficiency of this machinery upon the skill of her engineers, and upon the diligence exercised by them in its care and management. Be her armor and armament the most powerful and her commander the most capable and intrepid, if her machinery fails she is helpless, and no amount of seamanship and gunnery will avail against the enemy.

Were the Navy a mercantile concern the present state of affairs would not last beyond the time necessary to change it, for men with capital invested in machinery see to it that there is a force sufficient to keep it in proper maintenance; and surely if business people find such a course economical the Government can not do better than follow their example. The value of the naval machinery now owned by the Government and in process of construction is about $24,000,000, and it has now come to the point where Congress must decide whether it is more economical to properly care for this machinery and keep it always in an efficient condition, or to let it run on as long as it will and then replace it, taking meanwhile the risk of having it fail when most needed. As an illustration of the increased work thrown on the members of the engineer corps by the acqusition of the new Navy, I can state that the *New York* has added 17 per cent to the horse power of the machinery of vessels in commission; the *Columbia* will add 17.3 per cent more; and when the ships now authorized and building are finished the horse power of the propelling machinery of the Navy will have increased to nearly *two-and-a-half times its present amount*—and yet we are asked to run it with the same number of engineer officers that we now have.

The officers of the engineer corps at sea on the new vessels have altogether too much work to do now, and it is merely a question of time before the strain will tell. The result of this hard work is being seriously felt; retirements are increasing, and the Government thus subjected to an expense greater than would be involved in now granting a fair increase of numbers, while some of those who manage to complete a cruise in one of the high-powered ships only await a favorable opportunity to resign. Many of our young officers who have resigned to accept lucrative and responsible positions would have preferred to remain in the service if they could have seen any chance of advancement in it.

That the engineers have kept abreast of the times and in touch with modern methods is shown by the positions of trust and emolument that are being offered them, and if the services of these men are of such great value to private corporations they should be of still more value to the Government.

With a view to making the service more attractive to the assistant engineers I again recommend that the steerage be abolished, or at least that all commissioned officers be made ward room officers. Of the staff officers in the service the assistant engineers are the only ones who spend any considerable time in the steerage; a few assistant surgeons spend two years there, the assistant paymasters are never there, while the assistant engineer may spend six years or more in it. The marine officer is very seldom sent to sea in the steerage, while the ensign frequently on his first, and always on his second cruise, is made a ward room officer by being ordered as "a watch and division officer." No such action as this is taken in the case of the assistant engineer, for although he may have charge of a sub-division of the engineer division, with more men under him than the ensign has, and perform duty which is in all respects analogous to that performed by the ensign, he is not shown the same consideration.

In some of the large ships, in order to facilitate muster, inspection, etc., the engineer division is divided so that each assistant looks out for a portion of it, the chief engineer having the general supervision and making the customary reports, etc., for the entire division. I therefore recommend that assistant engineers be ordered to sea going ships as "watch and division officers of the engineer division," and that the regulations be so amended that when so ordered these officers shall be considered as ward-room officers. This will not injure any body, but merely make certain hard working officers a little more comfortable than they are now.

Coming to the question of conferring positive rank instead of the meaningless "relative" rank now held by members of the engineer corps, I earnestly trust that the Department will recommend to Congress some measure looking toward this just and proper recognition of the service performed by the officers of this corps. Why officers devoting their lives to the service, who have always had a certain portion of the crew to organize, muster, discipline, station, and drill in the various maneuvers intended to make the vessel efficient and destructive, and who from this time on will have under their control from 25 to 60 per cent of the entire ship's company, should be denied recognition as a military element in a fighting organization would be incomprehensible to any one not familiar with the inside workings of the Navy.

Outside of a few people in contact with the Navy through business or friends, the country at large knows or cares little about the Navy's methods; it pays for and wants a Navy organized on sound principles; that is about the extent of its thought about it. [illegible] the facts clearly understood I [illegible] Congress [illegible] would [illegible] a [illegible] tion, since the [illegible] nothing in the ship no command and would put questions of [illegible] on a uniform [illegible] that in the Army. [illegible] department; they [illegible] recognition within [illegible] should have [illegible] who directs the [illegible] other [illegible] Congress to [illegible] perform.

Engineers [illegible] ously as [illegible] those who arro[illegible] and [illegible] or perversion of [illegible] influenced by "sentiment," and that they aspire to command ships, can draw attention from the fact that the engineers of to-day are "combatants" in the strictest sense of the word, and that as such they should receive proper recognition. The naval battle of the future will be a thing of horror and of sudden wholesale carnage, if nerve directs; the ship will fight with her engines as well as with her guns, and the ram will be a more dangerous weapon and one more feared than the battery; and if her boilers or her engines fail she will become a drifting mass absolutely at the mercy of the enemy.

Let those who decry the engineers as "non-combatants" take home the lesson to be learned from the loss of the *Victoria*. It was not powder that there worked destruction—it was steam; and if such horror can occur in peaceful maneuvering what might not happen in time of battle? Here is a ship lost under the exact conditions of battle—rammed by another—and see how the "non-combatant" engineers came out of it. "The whole engine-room staff on watch perished to a man;" so says London "Engineering," and in further commenting on the dreadful catastrophe says:

> The loss of life in the engineering department is a commentary on the devotion displayed by the men of the staff. In the *Victoria* the number of combatant officers above the rank of midshipmen, not including admiral, was fifteen, viz: captain, commander, seven lieutenants, staff commander, three marine officers, and two sub-lieutenants. Happily, of these fifteen, only one was lost, *their duties not calling upon them to place themselves in the positions of greatest danger*. The number of engineer officers was six, viz: fleet engineer, two engineers, and three assistant engineers. Of these six, five were lost. Out of ten engine-room artificers, six were lost; and out of one hundred and ten stokers and leading stokers seventy-four were lost. These figures, of course, are approximate, and may require correction when the facts are more fully known. Undoubtedly, in a case such as this the heroism of the occasion is with the engine-room staff. They have to dive below, whilst others work towards the deck. Their awful position in the event of the ship capsizing needs no comment, and the fact that the engineer officers and men of the *Victoria* braved these dangers in the discharge of their duty, and went to what they must have known was certain death, forms one of the most noble pages in all the glorious annals of the British Navy.

(The italics are mine.)

Human mind can not imagine a position of greater nervous and mental strain than is endured by men who in battle are fastened in these death traps. If ever discipline and command of men is needed, it is right here. Surely the man who at a critical moment, by his nerve, training, and sense of duty and responsibility, keeps these men at their stations and makes of them a fighting factor that can be absolutely depended upon should be recognized as commanding them, and that by something more than sufferance and the honorary compliment of "relative" rank. It is much easier to control men where they have their danger constantly in sight, and where, if necessity compels, they can jump and save themselves, than it is in an air-tight fire room and beneath the battle hatches of an engine room, where the rupture of a steam pipe from any cause means death to all in the compartment. And the officers who do this and successfully aid the captain in carrying out his plan of battle are fully as important and deserving of just treatment as the officers who control the guns' crews and direct the fire of the guns as ordered by the captain. It is a question of men and ability, not one of corps prejudices.

That the engineers are influenced by "sentiment" is perfectly true, and I would be sorry to see it otherwise, for what are honor and courage and patriotism and other feelings that distinguish men from brutes but "sentiment," and what sort of a world would it be without just such "sentiments"?

The contention that the granting of authority to engineers to "command" in their own department will lessen the authority of the commanding officer of the ship is as absurd as it is childish. Marine officers have always exercised "command" over their guards on board ship, but nobody can be found to even intimate that the authority of the commanding officer over the marine guard is any less than if the marine officer did not have this command. The line officers themselves exercise such "command" in their divisions, but we hear of no instance of the commanding officer's authority being thereby lessened. The staff officers of the Army have actual rank, and, while a much larger and more complex organization than the Navy, the Army moves along with a harmony and an exhibition of mutual respect and good comradeship between officers of different departments which speak volumes.

The following extracts from Navy Regulations, 1893, may be contrasted with the organization of the Army, where every commissioned officer exercises command within his own department:

Article 18, Par. 1. Officers of the line only can exercise military command.

Art. 616, Par. 2. They (officers of gun, torpedo, and powder divisions) shall endeavor to bring the divisions under their command to the highest possible state of fighting efficiency.

Art. 22, Par. 1. They (staff officers) shall not, by virtue of relative rank and precedence, have authority to exercise military command.

Art. 714, Par. 3. The senior engineer shall at quarters take charge of the division, etc.

It is hard to understand why one officer should command his division and another officer only take charge of his, particularly (as will often happen) if the latter division is the larger and more important one.

The little value placed by the Department itself on "relative" rank is clearly shown by Article 23, Paragraph 2, of the Navy Regulations.

I renew my recommendation of last year that Congress be asked to provide an assistant to the Engineer-in-Chief in the person of an officer of the engineer corps. Such an assistant would become acting chief of Bureau during the absence of the Engineer-in-Chief, and would assume the responsibility for decisions on technical questions which are constantly arising. Under the present law this duty devolves on the chief clerk, who, not being an engineer, should not be required to assume the responsibility for such matters.

Closely woven into the general efficiency of the personnel of the engineer department is that of the enlisted men; so closely that unless ability and zeal characterize them the efficiency of the department can not help being low. Zeal the officer can inculcate if the material is of the right sort and he is not handicapped; but unless the material is good he can hardly be blamed if the results are sometimes only mediocre. The conditions in the Navy to-day are such that the best men are not being secured. I refer more particularly to the petty officers, and intend the assertion to be a general though not a sweeping one, for scattered through the service are some excellent men; but their number, on account of circumstances, is small and decreasing. It is not that the requirements are too great, but that the men having them are not attracted to the service and do not remain more than one enlistment.

Great difficulty is experienced in obtaining machinists of the proper qualifications; they are the leading petty officers in the engineer's force and should have special mechanical and governing abilities; they should be intelligent men who are up on machine work of all kinds and who are also fitters; men who have done general work at their trade, and have not spent their time on some specialty; men who have worked about engines both in building and in handling; and, finally, they should be young men. If the machinist has seen service at sea, he is so much better fitted for his position; but it is difficult to entice such men into the naval service, for they know that the merchant service offers them more consideration, better pay, and more privileges. The remedy lies not in making the requirements less exacting, but in bettering the surroundings of these men on board ship. In order that some little privacy be secured them, they should have quarters with bunks in them where they could rest at sea when off watch; this has been done in some of the larger ships, and I am sure the result will be gratifying.

They should receive more consideration as regards liberty than they do in some of our ships, where they are required to be mustered in line with the other men before going on shore, where they receive only the same consideration as the coal-passers whom they control and who may be in the same conduct class, while frequently they see their messmates, the ship's yeoman, apothecary, pay yeoman, and others with general passes, permitted to go at will. If the machinists, when deserving, were given general passes, it would make them feel that they were a more important part of the ship, and might keep many good men in the service who now leave after the first cruise because they think they are discriminated against. A general pass would be equivalent to a reward for good conduct and efficiency, would be prized by any man worthy of it, and would not injure the discipline of the ship any more than it does now by granting it to other chief petty officers.

The new regulations (General Order No. 409) make boiler-makers, blacksmiths, and coppersmiths second-class petty officers, which means that they will have to wear a blue shirt instead of the petty officer's coat. I believe the effect of this will be bad, for there are few mechanics who care to be dressed as a sailor was in the days of sailing ships. A coat gives the man a more military appearance, gives him a distinction above the men he is in charge of when on watch, and consequently more authority over them.

The pay of the blacksmith and of the coppersmith has been reduced to $50 a month. This is entirely too little for either of them. A good coppersmith on shore can command from three to four dollars a day, and it is idle to think that $50 a month will entice one into the service even with the privilege of sleeping in a hammock thrown in. Our new ships are full of copper pipes, but when an accident of any consequence occurs to one it has to be sent on shore for repairs. Every ship in commission, especially on a foreign station, should be capable with her own force of making any repairs to pipes that may be necessary; but they will not be as long as the present rate of pay for coppersmith is adhered to and his status on shipboard what it is. When we offered sixty dollars for them they would not enlist, and it would certainly be remarkable if we could now get them for less.

The blacksmith is the most generally useful of all the mechanics and the one whose services are always in demand. A competent machine, smith on shore is paid $3 and upward per day, and, as in the case of the coppersmith, $50 a month is no attraction for them. All of these rates should be first-class petty officers and paid the same as machinists.

There is another subject to which I would specially call your attention, and that is the necessity of more specific regulations about the drilling of men of the engineer's force on board ship. To my mind this drilling firemen and coal-passers in duties which they will never have to perform in action is unwise, but if they must be drilled let there be some consideration about it; don't make the performance of the duty for which they were shipped, and which they would have to perform in action, secondary to this drill, and don't make them drill when steaming in the tropics, which is often done.

The large amount of auxiliary machinery constantly in use and the frequent examination and adjustments of the main engines, added to the large proportion of ship's hull, double bottom, bunkers, bulkheads, etc., to be cared for by the engineer force, make the duties of the latter nearly as arduous in port as at sea; and they should not be taken from the engine and fire rooms for duty on deck, as is done on some ships. It is idle to say that their services are required on deck, for there is little work to be done on deck in the new Navy beyond keeping the ship clean and painted, and surely the present complements should suffice for that purpose.

If it be deemed necessary to drill the firemen at the guns, I would suggest that when such drills are in progress a division from the deck be sent below for instruction and work, and that at sea a certain number of men from each gun division be sent into the fire room for instruction in firing, so that when occasion requires it the fire-room force might receive a valuable auxiliary aid from the deck. As it now is, the fire-room force is crippled whenever any of its men are sick or absent, as none of the deck force is competent to take their places.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Steam Engineering, Navy Department.

Detailed objects of expenditures and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
STEAM MACHINERY.			
For completion, repairs, and preservation of machinery and boilers of naval vessels, including cost of new boilers, distilling, refrigerating, and auxiliary machinery, preservation of and small repairs to machinery and boilers in vessels in ordinary, receiving and training vessels, repair and care of machinery of yard tugs and launches	$425,000		
For purchase, handling, and preservation of all material and stores, purchase, fitting, repair, and preservation of machinery and tools in navy-yards and stations, and running yard engines	240,000		
For incidental expenses for naval vessels, yards, and the Bureau, such as foreign postage, telegrams, advertising, freight, photographing, books, stationery, and instruments	10,000		
		$675,000	$605,000
STEAM MACHINERY (SPECIAL).			
To commence new machinery to replace present engines, boilers, etc., of U. S. S. *Chicago* (submitted)	200,000		
To commence new machinery to replace present engines, boilers, etc., of U. S. S. *Hartford* (submitted)	100,000		
To replace present machinery, boiler, etc., of tug *Standish*, at Naval Academy, with new machinery, etc. (submitted)	15,000		
To replace present machinery, boiler, etc., of tug *Speedwell*, at Norfolk, Va., with new machinery, etc. (submitted)	15,000		
		330,000	
CONTINGENT.			
For contingencies, drawing materials, and instruments for the drafting room (act March 3, 1893)	1,000	1,000	1,000
SALARIES.			
Chief clerk (act March 3, 1893)	1,800		
One clerk of class 2 (same act)	1,400		
One clerk of class 1 (same act)	1,200		

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Steam Engineering, Navy Department—Continued.

Detailed objects of expenditures and explanations.		Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1895.
SALARIES—continued.				
One assistant messenger (same act)		$720		
Two laborers, $660 each (same act)		1,320		
One chief draftsman (same act)		2,250		
One assistant draftsman (same act)		1,400		
One assistant draftsman (same act)		1,000		
			$11,090	$11,090
CIVIL ESTABLISHMENT.				
Navy-yard, Portsmouth, N. H.:				
One clerk to Department, per annum (act March 3, 1893)	$1,200			
One messenger (same act)	600			
		1,800		
Navy-yard, Brooklyn, N. Y.:				
One clerk to Department, per annum (same act)	1,400			
One writer (same act)	1,000			
One messenger (same act)	600			
		3,000		
Navy-yard, League Island, Pa.:				
One clerk to Department, per annum (act March 3, 1893)		1,200		
Navy-yard, Norfolk, Va.:				
One clerk to Department, per annum (act March 3, 1893)	$1,300			
One messenger (same act)	600			
		1,900		
Navy-yard, Pensacola, Fla.:				
One writer, per annum (act March 3, 1893)		1,000		
Navy-yard, Mare Island, Cal.:				
One clerk to Department, per annum (act March 3, 1893)	$1,400			
One writer (same act)	1,000			
One messenger (same act)	600			
		3,000		
			11,000	11,900

It should be added in explanation of these estimates that they have been kept as low as possible and may be said to be for work almost in sight.

Very respectfully,

GEO. W. MELVILLE,
Engineer in Chief, U. S. Navy, Chief of Bureau.

The Honorable
The SECRETARY OF THE NAVY.

APPENDIX A.

TEST OF COCHRANE SEPARATOR BY THE EXPERIMENTAL BOARD AT THE NEW YORK NAVY-YARD.

[Chief Engineers W. W. Dungan, B. B. H. Wharton, and Isaac R. McNary, U. S. N., May, 1893.]

The Cochrane separator for horizontal pipes consists of a cast-iron shell, having opposite lateral openings near the top for the ingress and egress of the steam. The upper part is divided by a baffle plate having corrugations or ribs extending vertically from top to bottom, with two equal openings, one on each side next to the shell.

On each side of baffle plate, next to steam opening, is a deep rib which prevents the water from being driven through by the current of steam. The inside of shell is also provided with vertical ribs. The sides of the separator pitch in toward the center from all directions and lead direct to the well. The connection between the separator on the discharge side and the well is closed by a suitable plate to prevent an action of the current of steam on the water during its passage to the well, or after it is at rest.

The well is cylindrical in form, of cast iron, and fitted with suitable glass water gauge and drip pipe. (See drawing A, annexed.)

The Cochrane separator for vertical pipes consists of a cast-iron cylindrical shell having openings at top and bottom for ingress and egress of steam, with an angular baffle plate on which the steam impinges. It is provided with ribs to separate and divert the entrained water from the current of steam.

The well is formed by casting on lower head of separator a pipe projection which extends to the lower end of baffle plate, forming, with the sides of shell, an ample reservoir. It is fitted with glass water gauge and drip pipe. (See drawing B, annexed.)

METHOD OF MAKING TEST.

A 4-inch unclothed steam pipe of the length as shown in drawing D, annexed, was connected to main steam pipe of foundry boilers. On the pipe was secured a trough fitted with a drain leading to sewer. The cold-water supply was by a hose connection made to city water mains. Two calorimeters of Barrus's design, clothed with hair felt, were attached to pipe on each side and near the separator. Two steam gauges were fitted, one on the admission and the other on discharge side of separator.

Three pet cocks were inserted in the steam pipe, one on the vertical pipe leading to separator, one on discharge side, and one on horizontal pipe near its junction with the vertical pipe leading to separator.

A one-half inch pipe connected to the feed pump was inserted in the steam pipe, for the purpose of obtaining a larger amount of moisture in the steam than was possible with the water trough.

A preliminary test, with the arrangement of the various instruments placed as shown in drawing "C," annexed, was made, and it was plainly demonstrated that the calorimeter did not register the quality of the steam, and it was due to the fact that the water dropped and passed along the bottom of the pipe.

The calorimeter was then moved back to a point near the water trough, which caused an improvement, but, judging from the amount of water escaping from separator drip, it did not record correctly the moisture in the steam. It was then decided to place the calorimeter on a vertical pipe, as shown on drawing "D," annexed, which proved satisfactory.

The first test was made with the horizontal separator, and the results are given below. The valve near the end of steam pipe was adjusted, and no change allowed during the test; efforts to maintain a constant boiler pressure were not always successful, owing to the boiler in use supplying the foundry electric plant with power. The fire doors were kept closed, and all the steam furnished by the one boiler passed through separator or engine.

The readings of the instruments were at intervals of five minutes. The thermometers used with calorimeters were changed to correct any variations.

The height of water at commencement of test was noted on the glass gauge of calorimeter, and same height maintained at the end. The water from the drip box of calorimeter, on the admission side, was discharged into buckets partially filled with a known quantity of water, and carefully weighed when the buckets became filled.

The flow of steam from the end of the steam pipe was frequently observed, and in no case was there any dripping of water. The steam as it issued from the pet cocks on steam pipe was noted during each test; that from the cock on discharge side of separator was blue and dry; that from the cock on admission side cloudy and moist. That from the cock on horizontal pipe showed alternately comparatively dry and very moist. It is apparent from this action that the water would sometimes separate from the steam and travel along the bottom of the pipe, and when next tested it would remain incorporated with the steam.

The steam gauges were rather erratic in their action, owing to the vibrations of the engine being transmitted to the steam pipe upon which the test was made. The most reliable observations showed that the reduction of pressure due to the resistance of the separator was 1.9 pounds per square inch.

The following percentages do not take into consideration the loss of radiation of heat from the calorimeters. As they were well clothed with hair felt, it is not at all important.

COCHRANE HORIZONTAL SEPARATOR.

Moisture in steam due to condensation in the unclothed steam pipe.

Duration of test.	Per cent. of moisture on admission side.	Per cent. of moisture on discharge side.
20 minutes	13.33	2.58
20 minutes	14.96	2.59

Moisture in steam due to cold water in trough.

20 minutes	47.45	2.40
20 minutes	48.55	2.41

Moisture in steam due to cold water injected into steam pipe.

20 minutes	60.02	2.7

COCHRANE VERTICAL SEPARATOR (FLOW OF STEAM UPWARD).

Moisture in steam due to condensation in unclothed steam pipe.

Duration of test.	Per cent. of moisture in steam admission side.	Per cent. of moisture in steam discharge side.	
		Heat gauge.	Drip box.
20 minutes	43.11	2.4	0.95
20 minutes	44.68	2.35	.95

Moisture in steam due to cold water in trough.

20 minutes	79.37	2.36	0.73

Moisture in steam due to cold water injected into steam pipe.

15 minutes	89.21	2.33	0.78

COCHRANE VERTICAL SEPARATOR (FLOW OF STEAM DOWNWARD).

Moisture in steam due to condensation in the unclothed steam pipe.

20 minutes	18.06	1.96	0.94
20 minutes	12.44	1.82	1.00

Moisture in steam due to cold water in trough.

20 minutes	55.64	1.73	0.87

Moisture in steam due to cold water injected into steam pipe.

20 minutes	74.68	1.70	0.89

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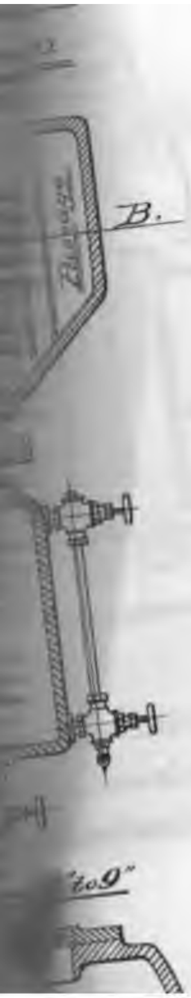

charge valves in this case were one-sixteenth inch thick of composition held in place by light springs and guided so as to insure their seating evenly.

The pump was driven by means of a beam with connection to the low-pressure crosshead of the engine.

Four trials were made. The first, with the boat tied to the wharf and in still water; the second, with the boat under way and under normal working conditions. Both of these trials were made with the propeller attached to the shaft. In order to secure a higher number of revolutions than was possible with the screw connected, it was then removed and the third trial was made with the boat alongside the dock and the water around the boat at rest. The fourth trial was made with the boat moored in a current of about two knots an hour.

The condenser was of the keel pattern, consisting of a copper pipe running from the condenser discharge on one side around to the air pump on the other, and of course, when the boat was secured to the wharf the circulation of the water past it was absolutely *nil* in the case of disconnected propeller, while with the propeller connected it was very small.

The results of the tests are shown in the following table, and it is to be noted that at as high a speed as 1,000 revolutions per minute, and with the poor flow of refrigerating water, due simply to the current in which the boat was moored, the vacuum was still 21 inches. It will also be noted that, under normal conditions, with the propeller in place and the boat driven through the water, the vacuum was 25 inches at as much as 250 revolutions.

The pump ran quietly and without any jar or thump, and on examination after the trials were finished the valves, springs, and pistons were found in good condition.

The pump in question was designed simply for experimental purposes, and there was, therefore, but a single one. In ordinary work the pumps will be in pairs, inasmuch as it might happen, if a single pump were used, that the main engine might stop in such a position that the suction opening would be closed, and the condenser might fill with water, due to the use of the "bleeder." To obviate this the pumps are arranged in pairs, with the cranks or eccentrics driving them at right angles, and the suction openings of such a size that it will be impossible, in any position, for both suctions to be closed.

FIRST TRIAL.

Revolutions.	Vacuum.	Steam pressure.	Cooling water.	Feed water.
140	20	105	44	90
158	20	138	44	122
180	17.5	160	44	135
170	17	155	44	140
SECOND TRIAL.				
208	25	105	44	50
225	25	120	....	52
250	25	150	....	60
254	25	156	....	61
245	25	145	....	60
255	25	155	....	60
240	25	138	....	56
255	25	155	....	61
227	24.5	120	....	54
240	25	140	....	58
THIRD TRIAL.				
585	22	155	50	68
638	22	155	50	70
720	22	155	50	100
790	16	155	50	138
840	15	155	50	120
FOURTH TRIAL.				
680	22	110	44	62
855	22	130	44	110
900	21	140	44	110
1,000	21	140	44	112

REPORT

OF THE

PAYMASTER-GENERAL OF THE NAVY.

CHIEF OF THE BUREAU OF SUPPLIES AND ACCOUNTS.

NAVY DEPARTMENT,
BUREAU OF SUPPLIES AND ACCOUNTS,
Washington, D. C., October 1, 1893.

SIR: Herewith I have the honor to submit the report of the Paymaster-General of the Navy for the fiscal year ending June 30, 1893, with estimates of appropriations for the coming fiscal year, and tabulated statements, as follows:

A.—General financial statement.
B.—Statement of provisions, clothing and small stores, and contingent.
C.—Statement of expenditures at shore stations and objects to which applied.
D.—Statement showing value of real estate and chattels and machinery plant at the several navy-yards and stations June 30, 1893.
E.—Compilation, showing cost of maintaining all naval vessels in commission during year ending June 30, 1893.
F.—Statement of value of supplies received and expended and balances fiscal year 1893.
G.—Statement of payments through the Paymaster-General' Office on contract, open purchase, and open contract vouchers during the year ended June 30, 1893.
H.—Value of supplies afloat June 30, 1893.
I.—Statement of public sales and report of deposits on account of sales during the fiscal year 1893.
J.—Schedule of proposals received.

The demands upon the department of supplies and accounts during the past year have been unusually great, owing to the presence in navy-yard ports for very considerable periods of the largest number of ships in commission and preparing for commission, witnessed for many years.

That these demands, innumerable, multifarious, and urgent, have been met quietly and with so little delay, shows the capability of the system under which we are working, and indicates the degree of progress made in its development. Its further success depends now and henceforth on the interest evinced in it by the officers to whom its administration is committed, the capacity and fidelity of the appointees in the general storekeeper's department at the several yards, and the employment in this bureau of a sufficient force of capable and experienced bookkeepers. In this respect the bureau is sadly deficient at the present time. Expert accountants are absolutely indispensable in the department of supplies and accounts, both in the bureau itself and at the several yards. The general storekeeper is a bonded officer and held to a strict accountability for the property committed to his care.

The accounts which in minute detail he is obliged to maintain, the information and reports he is constantly called upon to furnish, and the vast amount of current work that is at all times demanding the closest and most painstaking attention, render it absolutely necessary that the persons appointed for duty in his office should be men of more than ordinary intelligence, ability, and experience.

I would respectfully recommend that such regulations be established as shall require these employés to pass a satisfactory examination before receiving appointments.

The naval supply fund recommended in my last annual report, and established by act of Congress approved March 3, 1893, is in operation at the principal yards, viz: New York, Norfolk, and Mare Island.

Care is taken to purchase under it only such ordinary commercial articles as are in frequent demand and to keep a supply of them constantly on hand. As the stores are issued, charges are made against the proper appropriations and the fund reimbursed by adjustment through the accounting officers of the Treasury. If judgment and vigilance are exercised at the navy-yards in keeping up the stock of such stores as experience indicates are sure to be called for, there need never be an hour's delay in supplying to ships the greater portion of those articles, the procurement of which has heretofore been attended with so much annoying routine and vexatious delay. The benefits that will result from the establishment of the fund will become every day more and more apparent as increased use is made of it.

Section 3718, Revised Statutes, requires that, with certain exceptions, purchases of material for the Navy shall be made from the lowest bidder.

The act making appropriations for the support of the Army, approved July 5, 1884, provides that thereafter, in purchasing supplies for the Army, the award shall in every case "be made to the lowest responsible bidder for the best and most suitable article."

Under this act it is competent for the Department of War to invite dealers to submit with their bids samples of the articles they propose to furnish, and to make the award not necessarily to the lowest bidder, but to the lowest responsible bidder whose sample represents the best and most suitable article.

The purchase of supplies in all cases from the lowest bidder is neither advantageous nor economical, but on the contrary is productive oftentimes of serious delay in obtaining necessary and urgently needed articles, owing to repeated rejections, involving not infrequently additional expense to the Government, and the delivery finally of the poorest article that will pass inspection, an article which, by reason of inferior quality, must soon be replaced, necessitating further expenditure of money.

The Navy has suffered for many years from being obliged to make its purchases from the lowest bidder, and I recommend that Congress be asked to authorize awards to be made "to the lowest responsible bidder for the best and most suitable article," in conformity with the law governing the purchase of supplies for the use of the Army.

The method adopted for the preparation and assembling, prior to the commissioning of a ship, of all articles of outfit and supplies needed for her is attended with excellent results.

Under the regulations of the Department each bureau now furnishes the Paymaster-General with the prescribed outfit and allowance of supplies coming under its cognizance for each ship, properly classified and arranged under the headings "equipage and supplies."

When received by the Paymaster-General they are carefully collated and published in book form for each vessel, and the complement of officers, crew, and marines and the name of the ship printed on the title-page. As the publication of the books occupies considerable time, the lists, as soon as they can be copied in this Bureau, are sent in advance of publication to the navy-yard where a ship is to be fitted out, with instructions to assemble her stores.

The general storekeeper has precise information of all articles required for a vessel; he knows from the lists furnished him what is to be manufactured, where, and the date of completion of the article; also, what is to be shipped from other yards. Of the remaining articles those in store are set aside; those not in store are procured by purchase. In this way all articles named in the allowance tables are assembled, and when a ship is ready to receive her stores they should be on hand for delivery to her.

By the method described outfits have been assembled and delivered to the *Bancroft*, *Machias*, *Detroit*, and *New York*, and are now being assembled for the *Castine*, *Montgomery*, *Marblehead*, *Columbia*, and *Olympia*.

Allowance books for the *Bancroft*, *Detroit*, *Montgomery*, *Marblehead*, *Machias*, and *Castine* have been printed and distributed. The allowance book for the *New York* is in the hands of the printer. Those for the *Columbia* and *Olympia* are in course of preparation.

When a ship is put out of commission surveys are called on her outfit and stores, after which all serviceable articles of a permanent character are set aside for that particular ship. She can be recommissioned at any moment. Her allowance book gives immediate information as to what is to be placed on board, and the general storekeeper, having a record of what is set aside for her, is enabled, without further instructions, to complete her outfit.

The inventorying of supplies on hand for which the sum of $10,000 was appropriated in the act of March 3, 1893, is now in progress.

A further reduction has been made since my last report in the quantity of stores in general stock, showing a continuance of the beneficial effects of consolidation.

The tabulated statements appended will indicate the business transacted in the Bureau in the past fiscal year, its character, volume, and infinite detail. The money for which account is rendered in the financial statement (Appendix A) is about fifty millions.

It seems to me fitting and desirable, in view of the amount of business demanding the attention of the Paymaster-General and the weighty responsibility resting upon him, that there should be an assistant chief of the Bureau of Supplies and Accounts, and I recommend that Congress be asked to authorize that an officer of the pay corps shall be detailed as assistant chief of the Bureau of Supplies and Accounts who shall act as Chief of Bureau in the absence of the Paymaster-General, and who shall receive the sea pay of his grade.

The act of August 5, 1882, provided that the number of paymasters should be reduced from fifty to forty, the passed assistant paymasters from thirty to twenty, and the assistant paymasters from twenty to ten. Since this reduction has been effected considerable embarrassment has been experienced from the lack of a sufficient number of officers in the lower grades. Owing to the greater number of vessels now in commission and the importance of having assistants to the general storekeepers at navy-yards, it would be greatly to the interest of the service to restore the grade of assistant paymaster to its original number, and I therefore recommend that Congress be asked to fix the number of assistant paymasters at twenty, and that hereafter all appointments to the pay corps be made from graduates of the Naval Academy.

I have the honor to be, very respectfully, your obedient servant,

EDWIN STEWART,
Paymaster-General, U. S. Navy.

Hon. HILARY A. HERBERT,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Supplies and Accounts, Navy Department.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
SALARIES.			
Chief Clerk. (R. S., p. 27, sec. 167, R. S., p. 70, sec. 416, and act of March 3, 1893.)	$1,800.00		
Two clerks, class 4. (Same act.)	3,600.00		
Four clerks, class 3. (Same act.)	6,400.00		
Three clerks, class 2. (Same act.)	4,200.00		
Two stenographers, at $1,400 each. (Same act.)	2,800.00		
Eleven clerks, class 1. (Same act.)	13,200.00		
Two clerks, at $1,000 each. (Same act.)	2,000.00		
Two copyists, at $900 each. (Same act.)	1,800.00		
One assistant messenger. (Same act.)	720.00		
Two laborers, at $660 each. (Same act.)	1,320.00		
		$37,840.00	$37,810.00
PROVISIONS, NAVY.			
For provisions and commuted rations for the seamen and marines, commuted rations for officers and naval cadets on sea duty, and commuted rations stopped on account of sick in hospital and credited to the hospital fund, subsistence of officers and men when unavoidably detained or absent from vessels to which attached under orders (during which subsistence rations to be stopped on board ship and no credit for commutation therefor to be given), and fresh water, for drinking and cooking purposes, R. S., p. 733, secs. 3709, 3747, act of May 12, 1879, vol. 21, p. 3, sec. 1, and act of Mar. 3, 1893)	1,075,000.00		
Labor in general store houses and paymasters' offices in navy yards, including a chemist at $2,000 per annum. (Same act)	100,000.00		
		1,175,000.00	1,090,000.00
Note.—Increase of appropriation made necessary by reason of the increase in the number of enlistments authorized by act of Mar. 3, 1893.			
CONTINGENT.			
For freight and express charges; candles, fuel, books and blanks, stationery, advertising; furniture for general storehouses and pay offices in navy-yards; expenses of naval clothing factory and machinery for same; postage, telegrams, telephones, tolls, ferriages, yeoman's stores, iron safes, newspapers, ice, and other incidental expenses. (Act of March 3, 1893)	45,000.00	45,000.00	40,000.00
CIVIL ESTABLISHMENT.			
Navy-yard, Portsmouth, N. H.: In general storehouses: 2 bookkeepers, at $1,200 each, $2,400; 1 assistant bookkeeper, at $720; 1 bill clerk, at $1,000; 1 assistant clerk, at $720; 1 shipping and receiving clerk, at $1,000. Act of Jan. 30, 1885, vol. 23, p. 295, sec. 3, and act of Mar. 3, 1893)	5,840.00		
Navy-yard, Boston, Mass.: In general storehouses: 1 bookkeeper, at $1,017.25; 1 shipping clerk, at $1,000; 1 receiving clerk, at $1,000. In pay office: 1 writer, at $1,017.25. (Same act)	4,034.50		

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
CIVIL ESTABLISHMENT—continued.			
Navy-yard, Brooklyn, N. Y.: 1 writer to boards of inspection, $900. In general storehouses: 3 bookkeepers, at $1,200 each, $3,600; 1 assistant bookkeeper, at $1,000; 1 assistant bookkeeper, at $720; 3 receiving clerks, at $4 per diem each; 1 assistant receiving clerk, at $1.099; 3 shipping clerks, at $1,000 each, $3,000; 1 bill clerk, at $1,000; 1 assistant bill clerk, at $720; 2 leading men, at $2.50 per diem each; 5 pressmen, at $2.76 per diem each; 1 superintendent of coffee mills, at $3 per diem; 1 box maker, at $3 per diem; 1 engine tender, at $3.26 per diem; 1 coffee roaster, at $2.50 per diem; 1 fireman, at $2 per diem; 1 messenger, at $2.25 per diem. In pay office: 1 writer, at $1,017.25; 1 messenger, at $2.25 per diem. (Same act)	$28,412.03		
Navy-yard, League Island, Pa.: In general storehouse: 1 bookkeeper, at $1,200; 1 assistant bookkeeper, at $720. (Same act.)	1,920.00		
Navy-yard, Washington, D. C.: In general storehouse: 1 bookkeeper, at $1,200; 1 clerk, at $1,200; 1 receiving clerk, at $1,000; 1 bill clerk, at $1,000; 1 shipping clerk, at $1,000. In pay office: 1 writer, at $1,017.25. (Same act.)	6,417.25		
Naval Academy, Annapolis, Md.: In general storehouse: 1 bookkeeper, at $1,017.25; 1 receiving and shipping clerk, at $1,000. (Same act.)	2,017.25		
Torpedo Station, Newport, R. I.: In general storehouse: 1 clerk, at $1,200. (Same act.)	1,200.00		
Navy-yard, Norfolk, Va.: In general storehouses: 2 bookkeepers, at $1,200 each, $2,400; 2 assistant bookkeepers, at $1,017.25 each, $2,034.50; 1 bill clerk, at $1,000; 1 assistant bill clerk, at $720; 1 receiving clerk, at $942; 1 assistant receiving clerk, at $720. In pay office: 1 writer, at $1,017.25. (Same act.)	8,833.75		
Navy-yard, Mare Island, Cal.: In general storehouses: 2 bookkeepers, at $1,200 each, $2,400; 2 assistant bookkeepers, at $720 each, $1,440; 1 receiving clerk, at $1,000; 1 shipping clerk, at $1,000; 1 bill clerk, at $1,000. 1 assistant clerk, at $1,000. In pay office: 1 writer, at $1,017.25. (Same act.)	8,857.25		
		$67,532.03	$67,532.03

APPENDIX A.

GENERAL NAVAL ACCOUNT FOR THE FISCAL YEAR ENDING JUNE 30, 1893.

Appropriations.

DEBITS.

Balances July 1, 1892		$23,197,801.20
Appropriations for fiscal year 1893:		
Act of July 19, 1892	$23,473,051.65	
Deficiency act of July 28, 1892	148,461.53	
Appropriated by sundry civil bill, act August 5, 1892	250,000.00	
Deficiency act, March 3, 1893	100,241.95	
Made immediately available, act March 3, 1893	340,600.00	
		24,312,355.13
Overdrawn appropriations covered by warrant:		
For fiscal year 1892	17,488.95	
For fiscal year 1893	53,516.38	
		71,005.33
Interest on Navy pension fund		420,000.00
Covered in to the credit of the following funds:		
Clothing and small store fund	326,024.93	
Ordnance material, proceeds of sales	31,341.54	
Naval Hospital fund	74,818.19	
Pay of the Navy, deposit fund	141,442.80	
		573,627.46
Refunded by disbursing officers and others		985,001.78
Total receipts		49,759,000.57

CREDITS.

Charged to account of appropriations	31,088,439.45	
Naval pension fund	420,000.00	
Surplus fund 1892	184,669.83	
Surplus fund 1893	653,128.80	
		32,346,238.08
Balance June 30, 1893, to next account		17,412,762.49

Balances June 30, 1893.

Annual appropriations—		
1893	$2.460,853.53	
1892	377,004.56	
1891	174,950.24	
1891–'92	746.16	
1889	9.87	
1888	161.73	
1871–'72	.02	
		$3,013,726.11
Increase of the Navy:		
Vessels and monitors, act August 3, 1886	53,494.97	
Vessels for coast and harbor defense	2,500.00	
Monitors and vessels authorized by acts of March 3, 1885, and August 3, 1886	7,986.35	
Steel practice vessel	11,929.00	
Construction and machinery	1,860,875.12	
Traveling cranes	60,529.30	
Equipment	447,606.42	
Armor and armament	5,649,417.38	
Rapid twist guns	49,400.00	
Armor and gun steel	2.006,839.79	
Gun plant, Washington, D. C	2,605.22	
Nickel	450,958.94	
		10,604,142.49

Funds as follows:		
Pay of the Navy, deposit fund	$142,972.14	
Payment of Japanese award	30,706.72	
Bounty, destruction of enemies' vessels, act July 7, 1884	55,016.89	
Naval supply fund	200,000.00	
Prize money	455,889.81	
Navy pension fund	420,000.00	
Naval Hospital fund	313,925.81	
		$1,845,665.40
Continued appropriations for improvements		1,949,228.49
Total balance as above		17,412,762.49

Requisitions drawn by the Navy Department during fiscal year 1893.

Charged to current appropriations	$31,088,439.45	
Overdrawn appropriations	53,516.38	
General account of advances	5,126,655.42	
		$36,268,611.25
Deduct adjustments and Department settlements		6,515,468.15
Total amount advanced		29,753,143.10

ANALYSIS OF ADVANCES.

By the Navy Department:		
Advanced to the Navy agents, London	1,000,000.00	
Direct payments through Department	149,199.75	
Bills of exchange drawn by pay officers of ships	268,042.44	
Advance to Navy pay office, Washington	391.58	
		1,417,633.77
Through the Paymaster-General:		
To disbursing officers to pay vouchers	14,716,834.82	
To disbursing officers to pay labor rolls at navy-yards	5,357,600.95	
To disbursing officers to pay navy-yard rolls	3,888,417.45	
To pay officers of ships in commission	3,662,556.03	
To pay officers of the Marine Corps	710,100.08	
		28,335,509.33
Total advances as above		29,753,143.10

Receipts and payments for fiscal year ending June 30, 1893.

RECEIPTS.

Balance of account July 1, 1892		$24,008,416.74
Appropriations for fiscal year 1893 (see appropriations)		24,312,355.13
Overdrawn appropriations for the years 1892 and 1893		71,005.33
Interest on Navy pension fund (3 per cent on $14,000,000)		420,000.00
Sundry minor receipts, as follows:		
Proceeds of sales of condemned stores	$94,726.83	
Cash from sales of supplies	26,147.11	
Refunded in cash	5,139.02	
Checked by Fourth Auditor and paid	41.25	
Collected from contractors in default	2,600.47	
Undrawn pensions received from pensioners at Naval Home	13,546.36	
Rents collected at navy-yard, New York, and Naval Home	619.17	
Docking ships at Boston	1,292.07	
Cash from sales of deserters and deceased men's effects	1,810.14	
Interest paid by Navy agents, London	1,498.16	
Premiums received on bills of exchange	2,676.38	
Damages to vessels collected	4,470.87	
		154,567.83
Adjusted accounts		7,754.98
Total		48,974,100.01

PAYMENTS.

Secretary of the Interior to pay Navy pensions		$349, 785. 00
Payments to the surplus fund 1892	$184, 669. 83	
Payments to the surplus fund 1893	653, 128. 80	
		837, 798. 63
To the United States Treasury as miscellaneous receipts		30, 970. 52
Expenses of sales of condemned stores		1, 853. 16
For account of the Naval Establishment		29, 652, 869. 61
Balance June 30, 1893, to next account		18, 100, 823. 09
Total		48, 974, 100. 01

Statement of assets and liabilities.

ASSETS.

Appropriations, balance undrawn		$17, 412, 762. 49
Advances to disbursing officers, not credited:		
To navy-yards, stations, and Navy pay agencies	$46, 742. 18	
To the Navy agents, London	250, 000. 00	
To pay officers of ships	10, 000. 00	
		336, 742. 18
Balances in hand, as follows:		
Navy pay officers	48, 784. 13	
Pay officers of navy-yards and naval stations for labor rolls	108, 774. 73	
Disbursing officers, pay of the Navy	173, 188. 10	
Navy pay agents, London	140, 602. 77	
Pay officers of ships in commission	482, 293. 04	
Quartermaster of the Marine Corps	13, 408. 61	
Paymaster of the Marine Corps	10, 366. 18	
		977, 417. 56
Deposited in the Treasury, not credited to Department		90, 518. 51
Payments to seamen for deposits, not covered out of Treasury		19, 645. 20
Total assets		18, 837, 085. 94

LIABILITIES.

General account of advances overdrawn	431, 529. 99	
Credited by disbursing officers, advanced in July	4, 250. 00	
Bills of exchange, credited and not paid	42, 472. 05	
Deposits by seamen on interest:		
Covered into Treasury	142, 972. 14	
Not covered in the Treasury	66, 717. 77	
Vouchers, not reported paid	48, 320. 90	
		736, 262. 85
Balance as per account, receipts and payments		18, 100, 823. 09

Annual statement for the fiscal year 1893.

PAYMENTS.

Labor rolls at navy-yards and naval stations:		
Bureau of Yards and Docks	$550, 759. 14	
Bureau of Equipment	269, 484. 34	
Bureau of Navigation	147, 870. 29	
Bureau of Ordnance	965, 160. 12	
Bureau of Construction and Repair	2, 434, 146. 31	
Bureau of Steam Engineering	744, 651. 47	
Bureau of Supplies and Accounts	202, 678. 53	
Bureau of Medicine and Surgery	37, 502. 57	
		$5, 352, 252. 77
Approved money vouchers:		
Bureau of Yards and Docks	667, 613. 65	
Bureau of Equipment	572, 641. 75	
Bureau of Navigation	161, 158. 96	
Bureau of Ordnance	4, 591, 537. 00	
Bureau of Construction and Repair	617, 588. 81	
Bureau of Steam Engineering	424, 258. 44	
Bureau of Supplies and Accounts	503, 843. 49	
Bureau of Medicine and Surgery	172, 777. 44	
On account of the Navy Department	7, 033, 450. 78	
		14, 744, 870. 32

Pay of the Navy, 1893:		
Pay rolls of navy yards and stations and payments by navy pay agents	$3,269,420.64	
Paid on rolls of ships in commission	3,459,001.47	
Other payments	20,402.02	
		$6,748,82
Pay of the Navy, 1892		60,40
Pay miscellaneous:		
1893	207,326.00	
1892	19,523.64	
1891	65.80	
		226,91
Ships' bills: Supplies purchased at sea, etc		581,65
Commuted rations:		
At navy-yards and naval stations	31,067.40	
On ships in commission	689,347.40	
		720,41
Payments on account of the Marine Corps:		
By the quartermaster	221,437.54	
By the paymaster	456,182.54	
By the assistant quartermaster, Philadelphia	13,000.00	
By the navy pay officers	17,988.38	
Payments on rolls of ships in commission	154,549.21	
Other payments	1,374.67	
		864,53
Minor expenditures		352,9
Total payments on account of Naval Establishment		29,652,8

Analysis of expenditures.

C.—Costs of commission of ships in naval service:		
Pay of the Navy, 1893	$3,632,390.60	
Pay of the Marine Corps, 1893	193,407.83	
Commuted rations	546,093.10	
Other payments	896.39	
		$4,372,78
G.—Maintenance of navy-yards and naval stations:		
Portsmouth, N. H	64,590.31	
Boston, Mass	71,515.65	
Naval torpedo station	35,726.56	
Naval training station	204,231.65	
Naval station, New London	12,802.59	
Brooklyn, N. Y	151,789.09	
League Island, Pa	49,424.41	
Naval Home, Philadelphia, Pa	30,673.35	
Baltimore, Navy pay office	4,241.09	
Naval Academy, Annapolis	230,876.14	
Washington, D. C	86,786.82	
Norfolk, Va	83,920.13	
Port Royal, S. C	17,858.91	
Key West, Fla	9,417.65	
Pensacola, Fla	19,198.57	
Mare Island, Cal	78,636.42	
Naval station, Puget Sound	10,351.83	
Pay and commuted rations	1,162,041.17	
G.—Money vouchers	257,535.20	
		1,419,57
G.—Naval hospital, Yokohama	5,774.41	
Naval station, Pajo Pajo, Samoa	3,679.40	
Coaling station at Honolulu	4,845.50	
Coaling station at La Paz, Mexico	300.00	
		14,59
Labor rolls at navy-yard and naval stations		5,352,2
Ships' bills, purchases at sea		581,

X.—Supplies purchased and received by general storekeepers:		
Yards and docks	$217,861.04	
Equipment	427,603.55	
Navigation	80,556.86	
Ordnance	2,796,727.95	
Construction and repair	595,028.70	
Steam engineering	387,288.95	
Supplies and accounts	473,290.62	
Medicine and surgery	2,980.51	
		$4,981,338.18
A.—Money vouchers: Cost and valuation of ships		8,544,935.52
B.—Money vouchers: Equipage		21,272.17
D.—Money vouchers: Repairs of vessels		13,378.77
E.—Money vouchers: Real estate and chattels		607,232.64
F.—Money vouchers: Machinery plant		123,676.30
N.—Money vouchers: Experiments		55,149.24
O.—Money vouchers: Naval militia		6,085.44
Z.—Money vouchers: Conversion account		6,677.18
Payments for the Marine Corps at navy-yards and naval stations		709,983.13
Payments out of pay miscellaneous, 1893 and 1892		226,915.44
Sundry naval expenses:		
Interest paid on deposits by seamen	$8,137.16	
Discount on bills of exchange	10,402.00	
Discount on silver depreciation	2,504.95	
Naval attachés in Europe	28,541.69	
Expenses of Navy agency in London	5,725.34	
Board of Visitors, Naval Academy	874.88	
Repairs to marine barracks, Mare Island	3,527.39	
International naval review, payments to June 30, 1893	31,846.94	
Advertising	8,559.03	
Freights paid in transportation of supplies	68,294.01	
Bureau expenses, approved money vouchers	17.267.85	
Transportation of seamen	26,035.95	
Miscellaneous expenses	11,528.74	
Telegraph charges, money vouchers	529.53	
Oil purchased from Light-House Board	451.50	
Books and periodicals	2,916.62	
Charts, Hydrographic Office	4.059.86	
Instruments, etc	2,462.90	
Cost of outfits for apprentices	27,484.44	
		261,150.78
Pay of officers of the Navy on the retired list		848,080.24
Pay of officers of the Navy on leave or waiting orders		222,433.98
Pay and commuted rations of seamen awaiting draft or discharge		277,545.54
Honorable-discharge certificates to seamen		77,938.03
Pay of officers while traveling under orders		30,043.80
Fish Commission, pay and commuted rations		69,735.53
Coast Survey, pay and commuted rations		209,510.98
Light-House Service		69,284.27
Hydrographic duty		26,857.17
Nautical Almanac		10,500.04
Naval Observatory		26,876.82
Naval dispensary, museum of hygiene		12,537.63
Smithsonian Institution		3,323.96
Navy Department, chiefs of bureau and officers on duty		194,577.22
Boards, etc.:		
Naval examining board, Washington	24,208.59	
Naval examining board of engineers	9,575.89	
Medical examining board	7,337.53	
Special board duty	4,084.94	
Inspection and survey at navy-yards	19,116.23	
Inspector of pay corps and clerk	5.299.99	
Court-martial duty	3,164.79	
Naval proving ground	5,179.21	
		77,967.17
On inspection duty, as follows:		
At Dubuque, Iowa, torpedo boat	2,400.00	
Bath Iron Works	7,015.41	

On inspection duty, as follows—Continued.		
Cramp's shipyard, Philadelphia	$14, 779. 73	
Columbia Iron Works, Baltimore	14, 447. 00	
Richmond Locomotive Works	3, 294. 25	
Carnegie, Phipps & Co	1, 165. 47	
Bethlehem Iron Works	1, 057. 54	
Chester, Pa., boiler tubes	1, 764. 11	
City Point Works, South Boston	5, 787. 19	
Quintard Iron Works, New York	5, 842. 19	
Iron Works, South Brooklyn, torpedoes	3, 276. 71	
Continental Iron Works	751. 78	
Atlantic Iron Works	1, 316. 71	
Battleship *Texas*	1, 543. 02	
Monterey, Union Iron Works, California	9, 487. 80	
Olympia, Union Iron Works, California	9, 716. 43	
U. S. S. *Montgomery*	2, 538. 28	
U. S. S. *New York*	5, 473. 69	
U. S. S. *Columbia*	1, 190. 14	
U. S. S. *Oregon*	2, 558. 07	
U. S. S. *Machias*	1, 158. 91	
U. S. S. *Detroit*	1, 232. 88	
On duty at Thurlow, Pa	1, 182. 76	
On duty at Erie, Pa	368. 22	
On duty at Midvale Steel Company	554. 52	
U. S. S. *Bancroft*, Elizabethport	1, 665. 48	
		$101, 568. 29
Other special duty, as follows:		
Inspection of steel	40, 782. 09	
Inspection of ordnance	8, 623. 45	
Experimental duty, steam engineering	7, 148. 49	
Inspector of cellulose	1, 280. 00	
Inspection of merchant vessels	8, 577. 83	
Inspector of electric lights, Washington	2, 283. 56	
World's Columbian Exposition	28, 119. 44	
Supervisor of New York Harbor	4, 512. 32	
Special duty abroad	3, 094. 08	
Students and naval constructors abroad	14, 704. 40	
Superintendence, Army and Navy Hospital, Hot Springs	2, 000. 00	
Intercontinental railroad survey	2, 713. 97	
Instructors at colleges	2, 702. 75	
School-ship *St. Mary's*	11, 497. 54	
School-ship *Saratoga*	10, 077. 04	
School-ship *Enterprise*	6, 427. 21	
Torpedo School and War College, Newport	1, 761. 66	
Experimental duty	1, 873. 97	
Treasurer Mutual Aid Society, Washington	1, 526. 87	
Board of improvement, navy-yard, New York	3, 500. 00	
Marine rendezvous	7, 345. 21	
Special duty, Alaska	339. 72	
Special duty under orders from bureaus	2, 453. 15	
Ordnance instructor, Washington	355. 62	
Special duty at Philadelphia and Washington	3, 232. 88	
Survey for wharf at Apia, Samoa	554. 52	
Medical attendance, sick, New York and Philadelphia	5, 509 74	
Marine Hospital Service	741. 74	
Howell torpedo	619. 17	
On duty at Fort Mifflin	526. 03	
On duty at new naval magazine, Dover	810. 96	
Miscellaneous duty	5, 989. 05	
		191, 684. 46
Miscellaneous payments and certified claims:		
Auditor's certificates—pay of the Navy, 1892-'93	100, 417. 39	
Pay of the Navy, certified claims—deficiency act	52, 583. 37	
Mileage, Navy, Graham decision	64, 618. 59	
Enlistment bounties to seamen	14, 514. 89	
Relief of sufferers by wreck at Samoan Islands	1, 863. 30	
Extra pay to officers and men who served in war with Mexico	2, 734. 75	

Miscellaneous payments and certified claims—Cont'd.		
Bounty, destruction of enemies' vessels, act July 7, 1884	$1,022.44	
Prize money	3,564.16	
Auditor's certificates—pay Navy, 1891	1,285.21	
Contingent, Navy, 1893	1,052.39	
Provisions, Navy, certified claims	196.80	
Indemnity for lost clothing	4,684.60	
Checkages by Fourth Auditor	55.89	
Various certified claims, not classified	7,762.47	
Relief of Rodman M. Price, former paymaster U. S. Navy	45,204.08	
Relief of children of officers of the U. S. S. *Levant*	240.00	
Relief of Morrison and McIntosh	175.39	
Relief of Maj. Green Clay Goodloe	3,333.31	
Removal of remains of Ensign D. T. Ferrell	206.65	
Wharfage of U. S. monitor *Amphitrite*	2,752.00	
International Navigation Company	8,103.83	
Berwind-White Coal Manufacturing Company	16,372.09	
Payment of indemnity to Joseph Fernandez	1,000.00	
Medals Jeannette arctic exploring expedition	734.13	
		$334,477.73
Minor credits on pay rolls of ships in commission		10,539.32
Total expenditures, 1893		30,094,152.39

Reconciling statement.

DEBITS.

Total expenditures for fiscal year 1893		$30,094,152.39
Balances due June 30, 1892, and included in payments for 1893:		
Rolls of navy-yards and naval stations	$27,460.58	
Rolls of ships in commission	588,164.61	
		615,625.19
Overpayments June 30, 1893, to be accounted for in 1894		13,990.52
Total		30,723,768.10

CREDITS.

Overpayments July 1, 1892, brought forward:		
On rolls of navy-yards and naval stations	395.73	
On rolls of ships in commission	14,464.43	
		14,860.16
Credited to funds:		
Naval Hospital fund	40,396.18	
Clothing and small-stores fund	314,956.89	
		355,353.07
Forfeited by deserters	28,184.92	
Forfeited by court-martial and absences	25,640.71	
Checked by order of Fourth Auditor	5,400.01	
		59,225.64
Due deceased men, transferred to Fourth Auditor	4,239.53	
Clothing overdrawn by marines	4,293.13	
Retained pay, marines, first year's service	1,290.26	
Allotments checked, not reported paid	6,269.00	
Transferred accounts in transit	4,620.45	
Overpayments transferred, in transit	237.34	
		20,949.71
Balance due on rolls June 30, 1893:		
Navy-yards and naval stations	26,783.69	
Ships in commission	593,726.22	
		620,509.91
Credits to be deducted		1,070,898.49
Balance, payments on account of Naval Establishment		29,652,869.61

APPENDIX B.

Statement of receipts and expenditures of provisions, fiscal year 1893.

RECEIPTS.

Balances July 1, 1892:		
On hand at navy-yards and stations	$85,380.59	
On board ships in commission	73,789.50	
Provisions in transit	10,818.71	
		$169,988.80
Receipts at navy-yards and stations:		
Purchases	152,201.98	
Gain on issues	272.36	
Coffee mill (roasted coffee)	18,727.98	
		171,202.32
Receipts on board ships:		
Purchases	101,813.78	
Gain on issues	13,589.26	
Transfer from general storekeeper	1,256.31	
		116,659.35
Total		457,850.47

EXPENDITURES.

Expenditures at navy-yards and stations:		
For use (expense account)	93.12	
To other departments	33.36	
Condemned by surveys to loss account	1,666.91	
Condemned by surveys to be sold at auction	6,077.05	
Loss on issues	49.60	
To coffee mill (green coffee)	18,727.98	
Water to navy-yard tugs (cooking and drinking)	22.72	
To U. S. Marine Corps	41.01	
To World's Columbian Exposition	15.85	
		26,727.60
Expenditures on board ships:		
Issues to crew	206,589.97	
Issues to marines	30,118.11	
Issues to supernumeraries (not entitled to pay)	397.21	
Water for cooking and drinking purposes	5,477.88	
To other departments	129.68	
Sales to messes for cash	12,158.91	
Condemned by surveys to loss account	3,195.71	
Loss on issues	6,440.14	
To naval reserve militia	104.54	
		264,612.15
Balances, July 1, 1893:		
On hand at navy-yards and stations	102,763.05	
On board ships in commission	63,223.32	
Provisions in transit	524.35	
		166,510.72
Total		457,850.47

Provisions in transit June 30, 1893.

EXPENDITURES.

Fourth quarter, 1893:	
From J. A. Smith, general storekeeper, navy-yard, Washington, D. C.—	
To Rufus Parks, general storekeeper, navy-yard, New York	$476.21
From A. W. Bacon, general storekeeper, navy-yard, Mare Island, Cal.—	
To Paymaster M. C. McDonald, U. S. S. *Adams*	37.50

Fourth quarter, 1893—Continued.

From Rufus Parks, general storekeeper, navy-yard, New York—

To Paymaster O. C. Tiffany, U. S. R. S. *Vermont*	$0.25
To Paymaster S. L. Heap, U. S. S. *Dolphin*	3.06
To paymaster A. S. Kenny, U. S. S. *Chicago*	4.16
To Paymaster George E. Hendee, U. S. S. *Philadelphia*	3.17
Total	524.35

Clothing and small stores fund account.

RECEIPTS.

Clothing and small stores fund July 1, 1892		$1,138,458.15
Accounts receivable subject to settlement by the Fourth Auditor		330,003.51
Clothing and small stores purchased:		
Purchased at navy-yards and stations	$333,853.80	
Purchased by pay officers on ships	2,509.20	
Pay roll at clothing factory (manufacturing)	35,311.58	
		371,674.58
Gains:		
Profit and loss	30.01	
Gain on average prices	1,932.07	
Gain by 5 per cent addition to invoice prices	15,555.43	
Gain on issues	1,810.12	
		19,327.63
		1,859,463.87

EXPENDITURES.

Payments made for purchases in 1893	362,144.31	
Less due for purchases in 1892	10,360.72	
		351,783.59
Due for purchases made in 1893		19,890.99
		371,674.58
Clothing and small stores expended:		
Issued to officers, crew, and marines	288,604.00	
Clothing outfits to apprentices as bounty (1893)	28,534.88	
Sold to other departments	5,167.91	
Sold for cash	7,696.72	
		330,003.51
Losses:		
Expense account	255.42	
Loss by sales at public auction	9,448.75	
Loss by condemnation by surveys	3,102.19	
Clothing outfits issued to apprentices as bounty upon enlistment prior to July 1, 1890 (act March 2, 1889)	11,907.99	
		24,714.35
Clothing and small stores fund July 1, 1893		1,133,071.43
		1,859,463.87

Statement of the clothing and small stores fund for the fiscal year ending June 30, 1893.

ASSETS.

Cash accounts:		
Balance in Treasury to credit of fund	$227,154.03	
Balance in hand of paymaster at navy-yard, New York	1,479.23	
		$228,633.26

Stock accounts:		
On hand at navy-yards and stations	$436,899.45	
On hand at clothing factory	11,887.85	
On hand, condemned to be sold	21,389.22	
On board ships in commission	280,438.03	
Stores in transit	10,912.54	
On hand at World's Columbian Exposition	1,941.30	
		$763,468.39
Accounts receivable:		
For issues and sales awaiting adjustment by the Fourth Auditor	158,910.32	
Proceeds of sales at auction	1,904.16	
For disallowances in pay-officers' accounts	46.29	
		160,860.77
Total assets		1,152,962.42

LIABILITIES.

Due for unpaid bills for stores delivered	15,893.07	
Due for reservations unpaid	3,837.03	
Due for unpaid ships' bills	160.89	
Total liabilities		19,890.99
Clothing and small stores fund June 30, 1893		1,133,071.43
		1,152,962.42

Statement of purchases and payments.

PURCHASES.

Due for clothing and small stores, July 1, 1892:		
At navy-yards and stations	$9,912.27	
On board ships	448.45	
		$10,360.72
Due for purchases in fiscal year 1893:		
At navy-yards and stations	333,853.80	
On board ships	2,509.20	
		336,363.00
Total purchases		346,723.72

PAYMENTS.

Payments made for clothing and small stores during fiscal year 1893:		
At navy-yards and stations	324,035.97	
On board ships	2,796.76	
		326,832.73
Balance due on clothing and small stores:		
At navy-yards and stations	19,730.10	
On board ships	160.89	
		19,890.99
Total payments		346,723.72

Clothing and small stores in transit June 30, 1893.

EXPENDITURES.

Third quarter, 1893:	
From A. W. Bacon, general storekeeper, navy-yard, Mare Island, Cal.—	
To Paymaster R. T. M. Ball, U. S. S. *Petrel*	$4,307.89
Fourth quarter, 1893:	
To Paymaster M. C. McDonald, U. S. S. *Adams*	37.50
To Paymaster R. T. M. Ball, U. S. S. *Petrel*	70.04
To Paymaster F. T. Arms, U. S. S. *Ranger*	57.42
To Paymaster J. R. Stanton, U. S. S. *Mohican*	90.60
To Rufus Parks, general storekeeper, navy-yard, New York	1,268.08
From Rufus Parks, general storekeeper, navy-yard, New York:	
To Paymaster H. E. Jewett, U. S. S. *Yantic*	2,251.15
To Paymaster James H. Chapman, U. S. S. *Michigan*	764.68
To George Cochran, general storekeeper, navy-yard, League Island, Pa	281.63
To A. W. Bacon, general storekeeper, navy-yard, Mare Island, Cal	1,808.24
Total	$10,937.23

RECEIPTS.

Fourth quarter, 1893:	
By Paymaster H. R. Smith, U. S. S. *Concord*	24.69
From R. P. Lisle, general storekeeper, navy-yard, Norfolk, Va:	
Net balance in transit	10,912.54
Total	10,937.23

Statement of receipts and expenditures of contingent stores, fiscal year 1893.

RECEIPTS.

Balances July 1, 1892:		
On hand at navy-yards and stations	$15,739.49	
On board ships in commission	14,230.72	
Contingent stores in transit	323.42	
		$30,293.63
Receipts at navy-yards and stations:		
Purchases	20,897.21	
Gain on issues	154.56	
From other departments	53.08	
		21,104.85
Receipts on board ships:		
Purchases	741.43	
Gain on issues	172.66	
From other departments	102.86	
		1,016.95
Total		52,415.43

EXPENDITURES.

Expenditures at navy-yards and stations:		
For use (expense account)	16,786.13	
Issues to other departments	641.75	
Condemned by surveys to loss account	169.90	
Condemned to be sold at auction	1,162.63	
Issued to U. S. Marine Corps	5.88	
To World's Columbian Exposition	2.94	
		18,769.23

Expenditures on board ships:		
Issued to ships' use	$5,386.31	
Issued to other departments	419.30	
Condemned by surveys to loss account	104.03	
Loss on issues	84.87	
		$5,994.51
Balances July 1, 1893:		
On hand at navy-yards and stations	12,435.30	
On board ships in commission	14,741.28	
Contingent stores in transit	475.11	
		27,651.69
Total		52,415.43

Contingent stores in transit June 30, 1893.

EXPENDITURES.

Third quarter, 1893:	
From A. W. Bacon, general storekeeper, navy-yard, Mare Island, Cal.—	
To Paymaster R. T. M. Ball, U. S. S. *Petrel*	$60.00
Fourth quarter, 1893:	
To Paymaster J. R. Stanton, U. S. S. *Mohican*	60.00
From J. A. Smith, general storekeeper, navy-yard, Washington, D. C.—	
To R. P. Lisle, general storekeeper, navy-yard, Norfolk, Va.	74.76
To Paymaster James E. Tolfree, U. S. S. *Minnesota*	71.19
From Rufus Parks, general storekeeper, navy-yard, New York—	
To Paymaster H. E. Jewett, U. S. S. *Fantic*	149.40
To Paymaster James H. Chapman, U. S. S. *Michigan*	59.76
Total	475.11

APPENDIX C

Statement of expenditures of money and material at shore stations, and objects to which applied, during the fiscal year ended June 30, 1893.

TITLE A.—COST OF CONSTRUCTION OF SHIPS.

Vessels.	Money vouchers.	Labor.	Material.	Total.
Newark	$42,656.56	$404.24		$43,060.80
Maine	112,320.14	263,930.12	$28,715.62	404,965.88
Texas	131,330.52	248,209.00	224,367.96	603,907.48
Puritan	9,548.91	125,783.89	32,893.95	168,176.75
Monadnock	4,511.26	207,837.43	58,259.19	270,607.88
Amphitrite	50,702.31	122,657.28	57,554.63	230,914.20
Terror	137,928.40	93,735.39	13,035.80	244,699.68
Philadelphia	25,000.00			25,000.00
San Francisco		424.38		424.38
Concord	14,991.92	636.02		15,627.94
Bennington	12,990.17	631.99		13,622.16
Miantonomoh		10.86	2,578.42	2,589.28
Monterey	505,358.94	14,164.75	1,041.40	520,565.09
New York	1,216,119.43	19,276.38		1,235,395.81
Olympia	354,923.08	5,057.39		359,980.47
Cincinnati	1,736.24	354,669.31	71,771.33	428,176.88
Raleigh	157.02	338,296.59	186,544.72	524,998.33
Montgomery	44,740.61	8,082.07	1,231.77	54,054.45
Detroit	38,499.06	8,276.72	1,206.57	47,982.35
Marblehead	129,781.00	11,164.47	1,258.78	142,204.25
Bancroft	60,293.58	19,823.64	1,206.98	81,324.20
Destroyer	2,500.00			2,500.00
Ericsson	61,290.00	3,757.81		65,047.81
Machias	82,143.50	8,608.72	1,960.45	92,712.67

Statement of expenditures of money and material at shore stations, etc.—**Continued.**

TITLE A.—COST OF CONSTRUCTION OF SHIPS—Continued.

Vessels.	Money vouchers.	Labor.	Material.	Total.
Castine	$41,134.13	$8,631.52	$1,935.63	**$51,701.28**
Katahdin	323,853.00	4,282.72	66.80	**328,202.52**
Indiana	1,335,205.44	8,604.27		**1,343,809.71**
Massachusetts	1,248,245.33	9,273.15		**1,257,518.48**
Oregon	912,893.65	5,082.65		**917,976.30**
Columbia	497,705.20	8,917.73		**506,622.93**
Minneapolis	1,146,376.12	3,355.75		**1,149,731.87**
Brooklyn		10,153.45		**10,153.45**
Iowa		18,373.56		**18,373.56**
Gunboat No. 7		639.17		**639.17**
Gunboat No. 8		639.17		**639.17**
Gunboat No. 9		629.16		**629.16**
Total	8,544,935.52	1,933,970.73	685,630.09	**11,164,536.34**

TITLE B.—EQUIPAGE OF SHIPS.

Vessels.	Money vouchers.	Labor.	Material.	Total.
Newark	$253.80			**$253.80**
Yorktown	579.62			**579.62**
Petrel	20.16			**20.16**
Vesuvius		$74.72		**74.72**
Maine		297.88	$6.00	**303.88**
Texas		1,141.17	129.07	**1,270.24**
Cushing		173.16	93.87	**266.53**
Monadnock		136.02		**136.02**
Amphitrite		301.08	199.57	**500.65**
Terror		85.76	7.00	**92.76**
Philadelphia	30.30			**30.30**
Concord	4.00			**4.00**
Monterey	3,979.95	2,304.32	166.74	**6,451.01**
New York	4,685.00	450.32	95.85	**5,231.17**
Cincinnati		33.84		**33.84**
Raleigh		625.39	47.92	**673.31**
Montgomery	3,505.00	350.68	76.75	**3,932.43**
Detroit	3,505.00	547.41	418.85	**4,471.26**
Marblehead	3,657.09	135.44	2,327.42	**6,119.95**
Bancroft	687.50	1,053.01	12,115.45	**13,855.96**
Machias		83.88	3,828.34	**3,912.22**
Castine		39.72	3,838.67	**3,878.39**
Katahdin			2,756.74	**2,756.74**
Iwana			815.41	**815.41**
Dolphin	362.75			**362.75**
Constellation	2.00			**2.00**
Total	21,272.17	7,833.80	26,923.15	**56,029.12**

TITLE D.—REPAIRS OF SHIPS.

Vessels.	Money vouchers.	Labor.	Material.	Total.
Newark		$4,736.86	$4,886.14	**$9,623.00**
Charleston		18,028.42	6,056.40	**24,084.82**
Yorktown	$378.96	19,156.53	6,943.05	**26,478.54**
Petrel	24.00			**24.00**
Baltimore	8.00	26,687.24	10,767.14	**37,462.38**
Vesuvius		4,098.61	2,277.52	**6,376.13**
Cushing	543.89	1,338.62	6.06	**1,888.57**
Philadelphia	810.50	13,279.79	3,019.02	**17,109.31**
San Francisco	500.75	8,957.40	7,626.75	**17,084.90**
Concord	949.40	25,008.11	8,912.65	**34,870.16**
Bennington		11,059.63	3,336.67	**14,396.30**
Miantonomoh	80.50	28,905.90	13,939.33	**42,925.73**
Monterey		32.94	457.38	**490.32**
Bancroft		21.59	554.65	**576.24**
Stiletto		48.36		**48.36**
Triton		992.14	401.25	**1,393.39**
Chicago	326.88	22,465.59	14,641.09	**37,433.56**
Pensacola			116.28	**116.28**
Atlanta		29,039.41	7,366.20	**36,405.61**
Boston	145.00	1,191.66	126.13	**1,462.79**
Hartford		1,501.39	997.36	**2,498.75**
Richmond	26.00			**26.00**
Omaha		60.90	143.12	**204.02**
Ajax		78.44	77.90	**156.34**
Wyandotte		2,213.81	232.86	**2,446.67**
Comanche		989.48	233.03	**1,222.51**
Jason		39.52		**39.52**

Statement of expenditures of money and material at shore stations, etc.—Continued.

TITLE D.—REPAIRS OF SHIPS—Continued.

Vessels.	Money vouchers.	Labor.	Material.	Total.
Montauk		$270.72		$270.72
Nahant		47.52		47.52
Nantucket		1,427.04	$86.53	1,513.57
Passaic	$690.00	2,560.93	222.13	3,473.06
Mohican	5.442.45	18,304.33	7,994.19	31,740.97
Kearsarge		7,559.45	4,328.80	11,887.75
Dolphin	561.44	19,369.37	7,632.50	27,563.31
Adams		6,959.52	1,485.39	8,444.91
Alliance		10,501.95	4,109.42	14,611.37
Essex		1,492.85	144.15	1,637.00
Enterprise	11.75	14,224.67	6,668.65	20,905.07
Thetis		8,986.65	1,545.42	10,532.07
Alert			588.51	588.51
Ranger	10.25	7,246.01	1,326.98	8,583.24
Alarm		65.81		65.81
Michigan	2,600.00		20.00	2,620.00
Fern	14.00	2,841.64	731.20	3,586.84
Catalpa		291.74	6.14	297.88
Fortune		354.47	313.52	667.99
Leyden		234.52	258.47	492.99
Mayflower		224.72		224.72
Nina		13,303.59	3,330.91	16,634.50
Rocket		126.28		126.28
Vermont		5,486.89	338.05	5,824.94
Independence			2.92	2.92
Constitution		160.00	1,410.94	1,570.94
Monongahela		28,683.38	8,831.72	37,515.10
Constellation	2.00	6,920.24	1,634.27	8,556.51
Jamestown		280.68		280.68
Portsmouth		3,904.41	790.41	4,694.82
St. Marys		2,016.44	803.28	2,819.72
St. Louis		1,172.92	549.51	1,722.43
Dale		562.56	10.65	573.21
Franklin		13,228.26	4,787.03	18,015.29
Minnesota		59.02	20.53	79.55
Wabash		1,846.85	452.49	2,299.34
Wahneta		33.75	9.33	43.08
Iwana	253.00	1,558.63	333.05	2,144.68
Narkeeta		3,865.73	1,397.27	5.263.00
Albatross		8.00		8.00
Traffic		58.36	283.99	342.35
Corwine		512.56	96.51	609.07
Total	13,378.77	406,684.80	155,662.34	575,725.91

TITLE E.—REAL ESTATE AND CHATTELS.

Naval stations.	Money vouchers.	Labor.	Material.	Total.
Navy-yard, Portsmouth, N. H		$10,076.55	$6,689.11	$16,765.66
Navy-yard, Boston, Mass	$5,657.00	12,377.67	6,731.53	24.766.20
Naval torpedo station, Newport, R. I			3,122.94	3,122.94
Naval war college, Newport, R. I	21,083.47			21,083.47
Naval station, New London, Conn			1,827.52	1,827.52
Navy-yard, New York	114,101.62	51,242.53	32,409.47	197,753.62
Navy-yard, League Island, Pa	67,797.98	32,713.77	14,680.21	115,191.96
Naval Academy, Annapolis, Md	15,161.65			15,161.65
Navy-yard, Washington, D. C	7,769.67	18,831.31	11,053.46	37,654.44
New Naval Observatory, Washington, D. C.	126,417.02			126,417.02
Naval proving ground, Indian Head, Md	250.00	11.749.08	4,227.97	16,227.05
Navy-yard, Norfolk, Va	28,451.40	11,445.99	29,887.26	69,784.65
Naval station, Port Royal, S. C	150,545.08	7,229.36	5,287.05	163,061.51
Naval station, Key West, Fla			24.00	24.00
Navy-yard, Pensacola, Fla			98.00	98.00
Navy-yard, Mare Island, Cal	16,564.01	28,066.05	9,541.86	54,171.92
Naval station, Puget Sound, Wash	33,039.71	3.473.72		36,513.43
New naval magazine, Dover, N. J	20,394.03	7,153.12		27.547.15
Total	607,232.64	194,359.17	125,580.38	927,172.19

Statement of expenditures of money and material at shore stations, etc.—**Continued.**

TITLE F.—MACHINERY PLANT.

Subtitle.	Money vouchers.	Labor.	Material.	Total.
Navy-yard, Portsmouth, N. H.:				
Bureau of Construction and Repair		$5,781.19	$12,350.24	$18,131.43
Bureau of Steam Engineering		3,168.92	1,138.23	4,307.15
Navy-yard, Boston, Mass.:				
Bureau of Yards and Docks	$1,019.50		268.80	1,288.30
Bureau of Equipment			4,645.50	4,645.50
Bureau of Construction and Repair		22,774.17	18,104.72	40,878.89
Bureau of Steam Engineering		835.15	2,416.99	3,252.14
Naval torpedo station, Newport, R. I.:				
Bureau of Ordnance			1,719.21	1,719.21
Navy-yard, New York:				
Bureau of Equipment			10,943.64	10,943.64
Bureau of Construction and Repair		8,091.45	12,797.05	20,888.50
Bureau of Steam Engineering		2,482.14	33,843.83	36,325.97
Navy-yard, League Island, Pa.:				
Bureau of Yards and Docks			180.00	180.00
Bureau of Construction and Repair		1,717.39	10,022.86	11,740.25
Bureau of Steam Engineering			236.25	236.25
Navy-yard, Washington, D. C.:				
Bureau of Ordnance	122,656.80		147,722.86	270,379.66
Naval Academy, Annapolis, Md.:				
Bureau of Steam Engineering			2,203.92	2,203.92
Bureau of Navigation			3,340.61	3,340.61
Navy-yard, Norfolk, Va.:				
Bureau of Construction and Repair		753.21	7,711.90	8,465.11
Navy-yard, Mare Island, Cal.:				
Bureau of Construction and Repair		7,801.14	28,368.03	36,169.17
Bureau of Steam Engineering		954.26	4,840.84	5,795.10
Naval Proving Ground, Indian Head, Md				
Bureau of Ordnance		2,298.22	1,300.71	3,598.93
Total	123,676.30	56,657.24	304,156.19	484,489.73

TITLE G.—GENERAL MAINTENANCE.

Navy-yard, Portsmouth, N. H	$1,790.54	$117,473.38	$28,022.20	$147,286.12
Navy-yard, Boston, Mass	6,498.73	128,649.62	55,698.96	190,847.31
Naval magazine, Chelsea, Mass	492.45			492.45
Niter depot, Malden, Mass	134.95			134.95
Naval torpedo station, Newport, R. I	1,593.85	46,194.24	23,464.73	71,252.82
Naval training station, Newport, R. I	403.26	7,715.93	12,077.29	20,196.48
Naval war college, Newport, R. I	677.48		689.59	1,367.07
Naval station, New London, Conn	2,102.33	8,654.00	2,862.33	13,618.66
Navy-yard, New York	14,551.53	304,239.48	162,527.96	481,318.97
Navy-yard, League Island, Pa	5,575.94	124,070.73	46,286.12	175,932.79
Naval Home, Philadelphia, Pa	46,824.01	16,888.73		63,712.74
Naval Academy, Annapolis, Md	1,329.74	144,152.83	63,276.21	208,758.78
Navy-yard, Washington, D. C	6,642.75	174,830.06	76,673.42	258,146.23
Naval magazine, Bellevue, Md	55.25	1,584.63		1,639.88
Navy-yard, Norfolk, Va	3,992.01	142,078.29	65,034.27	211,104.57
Naval station, Port Royal, S. C	728.57	6,872.84	3,001.09	10,602.50
Naval station, Key West, Fla	988.42	8,320.79	1,422.65	10,731.86
Navy-yard, Pensacola, Fla	266.31	28,311.42	5,878.14	34,455.87
Navy-yard, Mare Island, Cal	7,111.49	185,957.06	63,792.58	256,861.13
Naval station, Puget Sound, Wash	120.74	4,579.50	2,441.67	7,141.91
Naval proving ground, Indian Head, Md	267.71	18,820.70	4,812.63	23,901.04
Naval magazine, Craney Island, Va	1,256.50			1,256.50
Naval hospital, Widow's Island, Me	233.36	682.50		915.86
Naval hospital, Portsmouth, N. H	5,898.04			5,898.04
Naval hospital, Chelsea, Mass	11,134.61	3,299.00		14,433.61
Naval hospital, New York	29,031.50	5,961.50		34,993.00
Naval laboratory, Brooklyn, N. Y	31,451.34	3,600.00		35,051.34
Naval hospital, Philadelphia, Pa	14,403.50	3,260.00		17,663.50
Naval hospital, Washington, D. C	12,926.22	2,100.00		15,026.22
Naval dispensary, Washington, D. C	2,512.50			2,512.50
Naval Museum of Hygiene, Washington, D. C.	3,566.48	1,320.00		4,886.48
Naval hospital, Norfolk, Va	13,646.94	3,822.16		17,469.10
Naval hospital, Pensacola, Fla	863.90			863.90
Naval hospital, Mare Island, Cal	17,697.55	5,382.83		23,080.38
Sackett's Harbor, New York	617.60			617.60
Navy pay office, Baltimore, Md	39.89			39.89
Erie, Pa	548.00			548.00
Hydrographic Office	9,559.21			9,559.21
Total	257,535.20	1,408,822.22	618,561.84	2,374,919.26

TITLE V.—MISCELLANEOUS.

Objects.	Money vouchers.	Labor.	Material.	Total.
Advertising	$8,922.12			$8,922.12
Telegraphing	3,327.58			3,327.58
Freight on stores	46,553.86			46,553.86
Transportation of enlisted men	27,360.87			27,360.87
Incidental expenses of bureaus, Navy Department	17,267.85			17,267.85
Printing, stationery, etc., for inspectors, notary's fees, custom-house charges, back pay, mileage, etc	17,949.82			17,949.82
Miscellaneous		$182,834.64	$76,612.57	259,447.21
Total	121,382.10	182,834.64	76,612.57	380,829.31

TITLE Z.—CONVERSION ACCOUNT. (FOR MANUFACTURE).

Subtitles.	Money vouchers.	Labor.	Material.	Total.
Bureau of Yards and Docks:				
Navy-yard, League Island, Pa		$80.64		$80.64
Navy-yard, Boston, Mass		4.40		4.40
Navy-yard, Washington, D. C		119.67	$10.53	130.20
Bureau of Equipment:				
Navy-yard, Portsmouth, N. H		4,998.53	5,968.35	10,966.88
Navy-yard, Boston, Mass		65,118.34	50,253.91	115,372.25
Navy-yard, New York		33,531.76	31,925.23	65,456.99
Navy-yard, Washington, D. C		1,608.49	819.96	2,428.45
Navy-yard, Norfolk, Va		7,016.40	10,872.49	17,888.89
Navy-yard, Mare Island, Cal		21,926.31	81,207.83	103,134.14
Bureau of Navigation:				
Navy-yard, Washington, D. C		12.72		12.72
Bureau of Ordnance:				
Navy-yard, Portsmouth, N. H		246.11	3,337.56	3,583.67
Navy-yard, Boston, Mass		29.64	808.70	838.34
Naval Torpedo Station, Newport, R. I		4,565.24	18,564.10	23,129.34
Navy-yard, New York		9,115.09	89,165.35	98,280.44
Navy-yard, League Island, Pa		2,674.36	49,137.81	51,812.17
Navy-yard, Washington, D. C		604,284.35	612,140.68	1,216,425.03
Navy-yard, Norfolk, Va		1,637.24	5,594.93	7,232.17
Navy-yard, Mare Island, Cal		5,295.07	124,055.79	129 350.86
Bureau of Construction and Repair:				
Navy-yard, Portsmouth, N. H		29,779.98	9,143.00	38,922.98
Navy-yard, Boston, Mass		14,883.78	2,153.31	17,037.09
Navy-yard, New York		57,676.05	43,330.81	101,006.86
Navy-yard, League Island, Pa		2,096.69	2,240.81	4,337.50
Navy-yard, Washington, D. C		25,948.84	2,040.42	27,989.26
Navy-yard, Norfolk, Va		32,968.91	35,763.74	68,732.65
Navy-yard, Mare Island, Cal		7,332.87	14,696.08	22,028.95
Bureau of Steam Engineering:				
Navy-yard, Portsmouth, N. H		31,169.69	10,522.17	41,691.86
Navy-yard, Boston, Mass		755.06	6,444.29	7,199.35
Navy-yard, New York		34,574.38	26,988.39	61,562.77
Navy-yard, Norfolk, Va		5,652.73	1,419.17	7,071.90
Navy-yard, Mare Island, Cal		3,867.43	1,757.28	5,624.71
Bureau of Supplies and Accounts:				
Navy-yard, New York	$6,677.18	35,311.58	90,424.63	132,413.39
Total	6,677.18	1,044,282.35	1,330,787.32	2,381,746.85

Statement of expenditures of money and materials at shore stations, etc.—Continued.

RECAPITULATION.

Titles.	Money vouchers.	Labor.	Material.	Total.
A.—Cost of construction of ships	$8,544,935.52	$1,933,970.73	$685,630.09	$11,164,536.34
B.—Equipage of ships	21,272.17	7,833.80	26,923.15	56,029.12
C.—Cost of commission of ships	854.20			854.20
D.—Repairs of ships	13,378.77	406,684.80	155,662.34	575,725.91
E.—Real estate and chattels	607,232.64	194,359.17	125,580.38	927,172.19
F.—Machinery plant	123,676.30	56,657.24	304,156.19	484,489.73
G.—General maintenance	257,535.20	1,498,822.22	618,561.84	2,374,919.26
I.—Special duty			310.48	310.48
N.—Models and experiments	55,149.24	26,807.82	48,336.90	130,293.96
O.—Naval militia, arming and equipping	6,085.45		17,723.27	23,808.72
V.—Miscellaneous	121,382.10	182,834.64	76,612.57	380,829.31
W.—Condemned by survey	5,353.37			5,353.37
Z.—Conversion account (for manufacture)	6,677.18	1,044,282.35	1,330,787.32	2,381,746.85
Expended for specific objects, as above	9,763,532.14	5,352,252.77	3,390,284.53	18,506,069.44
Title X.—Supplies in store	4,981,338.18			4,981,338.18
Total	14,744,870.32	5,352,252.77	3,390,284.53	23,487,407.62

APPENDIX D.

Statement showing the value of real estate and chattels and machinery plant at the several navy-yards and stations, June 30, 1893.

Navy-yards and stations.	Real estate and chattels.	Machinery plant.
Navy-yard, Portsmouth	$2,826,333.24	$280,076.36
Navy-yard, Boston	10,860,014.00	1,046,027.27
Torpedo station, Newport	237,796.70	55,780.03
Training station, Newport	241,125.75	6,500.00
Naval War College, Newport	101,232.57	
Naval station, New London	128,540.57	6,136.16
Navy-yard, New York	12,734,345.04	828,032.32
Navy-yard, League Island	2,852,056.88	176,090.92
Naval Academy, Annapolis	645,139.24	10,344.46
Navy-yard, Washington	4,400,662.70	1,853,668.91
New Naval Observatory	602,206.22	
Naval Proving Ground	59,620.20	4,132.82
Navy-yard, Norfolk	5,690,169.75	574,509.18
Naval station, Port Royal	328,875.54	
Naval station, Key West	299,610.30	8,291.55
Navy-yard, Pensacola	1,886,020.77	45,459.00
Navy-yard, Mare Island	4,943,826.51	273,909.98
Naval station, Puget Sound	54,152.33	
New naval magazine, Dover	70,337.53	
Total	48,962,365.84	5,168,959.86

APPENDIX E.

Compilation showing cost of maintaining all naval vessels in commission during year ended June 30, 1893, excepting for medicines.

Vessels.	Money expended.										
	Pay of officers, crew, and marines.	Rations, amount commuted.	Special credits: honorable discharge money, outfits to apprentices, etc.	Incidental expenses: Postage, freight, pilotage, current repairs abroad, etc.							
				Bureau, Equipment.	Navigation.	Ordnance.	Construction and Repair.	Steam Engineering.	Supplies and Accounts.	Medicine and Surgery.	Secretary's office.
Adams	$73,403.17	$9,661.50	$273.00	$80.39	$314.00		$0.10		$42.34	$9.88	$45.42
Albatross (Fish Commission)	37,188.52	6,334.80								7.30	50.16
Alert	65,723.33	9,647.20	1,257.00	392.48	188.06		2,240.66		121.15	233.37	427.79
Alliance	76,293.62	10,647.30	419.42	1,001.05	318.97	$0.95	182.95	$211.65	130.75	154.51	778.95
Atlanta	127,714.72	18,931.20	561.00	260.58		178.00		38.05	5.10	20.88	624.24
Baltimore	162,133.80	19,194.60	1,107.00	435.94	291.91	.32	12.39	.30	48.13	65.75	1,366.48
Bancroft	17,792.40	2,421.30		.50					1.34	16.10	2.06
Bennington	99,375.40	10,860.30		585.41	46.49	1.94	1,499.54	1,493.66	53.92	137.78	153.43
Boston	134,738.62	22,747.50	2,163.00	1,880.85	775.40	2.40	333.01	149.74	146.17	106.75	1,027.20
Charleston	141,670.32	16,271.40	990.00	1.00	10.50		83.25	14.41	16.55	50.14	58.98
Chicago	184,391.06	24,711.00	2,410.00	258.13	171.00				76.93	93.46	881.74
Coast Survey vessels	168,696.48	30,766.20							5.04	145.39	123.37
Concord	93,117.86	11,140.80		231.12	142.00		32.10	45.28	15.62	18.42	245.17
Constellation	80,769.09	13,050.60	843.00	559.11	1.49		306.87		50.58	79.00	220.35
Cushing	14,300.79	2,445.30							7.00		
Dale (receiving ship)	59,209.88	9,828.60	12,358.46		47.00		43.33		10.03	146.00	15.45
Dolphin	55,295.67	11,810.40	711.00	357.75				1.74		27.69	326.26
Essex	63,753.64	8,190.60	90.00	1,134.04	682.29	6.83	5.10	6.65	130.48	399.53	122.22
Fern	26,088.21	4,985.70	789.00								
Fish Hawk (Fish Commission)	20,460.30	4,461.30									
Franklin (receiving ship)	85,373.07	16,518.00	2,790.00	.68	2.50			5.70	.56	81.50	137.70
Independence (receiving ship)	108,660.96	20,745.00	11,420.58		108.00				1.50	18.00	107.30
Jamestown	16,235.94	2,360.70		129.00	19.00				16.05	20.87	6.55
Kearsarge	89,292.00	13,075.10	192.00	222.06	479.90				4.40	133.99	971.76
Lancaster	164,933.20	24,002.70	249.00	620.03	465.12	8.85	315.42	99.64	56.77	1,513.41	4,518.25
Marion	93,279.29	11,755.80	195.00	593.85	306.37	6.22	137.98	43.83	252.47	311.00	717.66
Miantonomoh	82,836.47	8,094.30	1,473.00	194.12			8.33			37.00	5.50
Michigan	53,202.27	11,113.80	3,415.80	168.45	536.41	2.50	5,150.49	557.45	3.10	130.15	534.33
Minnesota (receiving ship)	72,154.90	13,970.70	13,476.09	28.40	128.74	8.04	22.13	18.10	39.79	118.41	145.06
Mohican	97,216.58	15,778.50	512.51	575.85	437.67	3.25	48.75	50.69	140.68	60.18	293.55
Monitors	33,480.13	7,611.30									
Monocacy	70,548.85	11,820.30	2,627.00	1,740.32	203.12	49.94	688.31	49.34	55.94	104.03	1,560.15
Monongahela	97,604.29	15,809.10	119.43	536.07	387.58	.33	12.72	.50	10.89	144.69	100.40
Monterey	30,437.60	7,153.50	28.62					8.00			30.00
Naval Academy vessels, including Enterprise	50,133.44	10,255.20									

Compilation showing cost of maintaining all naval vessels in commission during year ending June 30, 1893, excepting for medicines—Continued.

Vessels.	Money expended.										
	Pay of officers, crew, and marines.	Rations, amount commuted.	Special credits: honorable discharge money, outfits to apprentices, etc.	Incidental expenses: Postage, freight, pilotage, current repairs abroad, etc.							
				Bureau, Equipment.	Navigation.	Ordnance.	Construction and Repair.	Steam Engineering.	Supplies and Accounts.	Medicine and Surgery.	Secretary's office.
Newark	$172,531.12	$21,565.20	$516.00	$588.95	$180.65	$7.47	$1,128.63	$111.11	$94.00	$383.02	$632.64
Palos	15,671.46	2,958.00	471.00	35.52	13.05	.79	.33	5.64	34.15	14.43	37.00
Petrel	61,259.07	7,829.40	1,865.00	841.77	64.88	1.99	1,041.75	288.35	89.04	100.56	404.82
Philadelphia	166,903.53	17,294.70	527.61	656.72	251.00			1.00	35.12	61.91	306.11
Pinta	38,232.38	6,044.70	477.00	179.13	439.00	23.63	39.82	95.90	88.02	125.45	148.40
Portsmouth	88,845.92	14,524.90	969.00	70.00	209.70		63.26			173.98	215.76
Ranger	62,412.72	8,848.50	621.00	5.81	147.00		975.00			22.50	27.00
Richmond (at training station)	149,587.19	51,805.50	7,751.29							726.99	
San Francisco	161,483.83	19,613.70	594.09	417.85	511.56	2.00	111.60		57.84	36.20	236.70
St. Louis (receiving ship)	52,632.90	8,087.70	4,519.30		15.56				2.27	22.58	5.45
Thetis	59,195.91	10,903.80	120.00		269.70				5.14	23.10	53.23
Vermont (receiving ship)	198,946.91	41,572.10	22,331.08	19.25	13.25	1.60		1.50	30.75	72.55	33.87
Vesuvius	38,787.04	7,344.90				1.71		1.50			3.72
Wabash (receiving ship), including Passaic	94,505.97	18,467.40	3,843.36		60.00					71.00	
Wahneta	2,712.77	676.50									
Yantic	63,751.66	7,283.10	828.00	1,481.31	395.32	7.43	210.99	5.94	236.15	897.32	851.67
Yorktown	90,513.96	12,025.80	630.00	351.89	101.50				14.92	68.24	480.33
Total	4,370,687.79	701,558.10	106,564.85	16,575.96	8,735.69	316.19	14,694.81	3,305.67	2,124.68	7,188.01	19,094.78

Compilation showing cost of maintaining all naval vessels in commission during year ended June 30, 1893, excepting for medicines—Continued.

Vessels.	Value of stores expended.						Repairs at navy-yards while in commission.	Total.	Time in commission.
	Bureau Equipment.	Navigation.	Ordnance.	Construction and Repair.	Steam Engineering.	Supplies and Accounts.			
									Mos.
Adams	$12,897.25	$70.05	$1,409.97	$1,028.98	$2,534.94	$5,922.72	$8,444.91	$116,198.62	12
Albatross (Fish Commission)						448.22	8.00	44,037.00	12
Alert	6,730.26	109.41	1,050.79	524.93	1,882.48	3,623.02	588.51	94,740.44	12
Alliance	21,974.74	236.65	1,020.98	1,092.89	2,833.90	6,783.97	14,611.37	138,684.71	12
Atlanta	28,050.31	404.13	4,205.08	4,029.31	4,953.93	9,336.70	36,405.61	235,658.82	12
Baltimore	62,717.70	808.50	4,831.38	2,892.76	8,137.55	15,058.47	37,462.38	316,565.36	12
Bancroft	1,060.26	40.66	58.30	645.07	210.37	926.91	576.24	23,760.51	4
Bennington	20,305.72	126.89	2,402.28	3,000.95	5,088.53	12,590.27	14,396.30	172,118.81	12
Boston	22,808.76	445.75	6,217.80	2,463.41	3,415.19	7,281.56	1,462.79	207,165.90	12
Charleston	51,177.00	361.84	4,280.15	3,196.69	10,967.60	12,029.06	24,084.82	265,263.71	12
Chicago	19,052.93	821.04	4,963.98	3,924.40	7,703.80	13,689.60	37,433.56	300,583.23	12
Coast Survey vessels						211.85		199,948.33	12
Concord	13,770.73	666.88	2,565.83	2,111.44	6,621.12	6,879.39	34,870.16	172,473.92	12
Constellation	8,102.74	74.84	1,138.78	2,322.52		5,367.79	8,556.51	121,443.87	12
Cushing	877.61	74.37	551.37	225.87	962.33		1,888.57	21,333.21	12
Dale (receiving ship)	2,302.94		324.57	119.84		75.13	573.21	85,054.42	12
Dolphin	7,393.39	358.21	1,023.10	1,070.15	8,711.80	49.91	27,563.31	109,700.38	12
Essex	4,507.95	22.01	1,319.51	899.25	930.20	6,458.34	1,637.00	90,205.64	9½
Fern	2,284.67	18.04		191.17	545.44		3,586.84	38,489.07	12
Fish Hawk (Fish Commission)						5.82		24,927.42	12
Franklin (receiving ship)	4,639.69	22.42	372.09	457.82	411.01	557.70	18,015.29	129,388.73	12
Independence (receiving ship)	7,776.21	250.75	372.81	761.93	127.13	403.42	2.92	156,756.81	12
Jamestown	1,203.22	832.98	200.23	663.68	10.76	5,261.63	280.68	27,175.29	2½
Kearsarge	13,125.19	138.19	1,632.49	813.28	1,018.49	6,685.15	11,887.75	139,671.75	12
Lancaster	13,010.17	65.27	3,968.34	1,743.03	1,293.82	9,633.83		227,096.85	12
Marion	14,040.55	181.05	2,150.36	842.01	1,640.62	7,614.45		134,068.51	12
Miantonomoh	9,069.25	59.49	1,747.01	1,891.59	1,984.04	4,103.38	42,925.73	154,429.21	12
Michigan	6,925.27	37.61	101.90	1,507.98	792.64	301.07	2,620.00	87,101.22	12
Minnesota (receiving ship)	5,555.62	30.46		4,231.40	288.62	421.02	79.55	110,717.03	12
Mohican	21,450.07	351.15	2,260.13	1,767.00	2,639.80	6,103.65	31,740.97	181,430.98	12
Monitors	2,140.12		181.80	638.40	191.34		156.34	44,408.43	12
Monocacy	8,590.36	156.83	1,664.70	1,305.30	4,322.65	2,790.47		108,277.61	12
Monongahela	8,744.57	48.82	7,473.84	2,254.36	75.75	12,792.78	37,515.10	183,631.82	12
Monterey	388.91	124.05	878.67	324.95	6,633.43	60.34	490.32	52,558.39	4
Naval Academy vessels, including Enterprise	2,264.24	26.48		1,081.69		87.66	20,905.07	84,951.78	12
Newark	35,037.68	534.47	5,347.51	4,194.18	5,600.45	16,666.47	9,623.00	274,742.55	12
Palos	6,858.04	221.24	898.52	1,804.90	324.15	113.91		28,962.73	5
Petrel	6,400.79	368.45	2,932.90	863.71	2,344.73	4,285.13	24.00	91,004.34	12
Philadelphia	12,382.67	369.22	4,886.04	3,100.41	4,452.51	12,336.54	17,109.31	240,234.40	12
Pinta	9,407.35	28.48	362.09	927.41	2,518.09	57.58		59,195.03	12

Compilation showing cost of maintaining all naval vessels in commission during year ended June 30, 1893, excepting for medicines—Continued.

Vessels.	Values of stores expended.						Repairs at navy-yards while in commission.	Total.	Time in commission.
	Bureau Equipment.	Navigation.	Ordnance.	Construction and Repair.	Steam Engineering	Supplies and accounts.			
Portsmouth	$8,125.63	$42.75	$1,794.68	$513.10	$62.45	$10,596.67	$4,694.82	$130,902.62	12
Ranger	12,802.05	23.46	922.35	1,156.02	5,176.60	3,810.16	8,583.24	105,533.41	12
Richmond (at training station)	8,432.43	877.44	2,964.02	4,811.50	10,705.50	104.37	26.00	237,792.23	12
San Francisco	55,582.26	281.74	6,429.25	3,057.83	9,983.13	17,123.16	17,084.90	292,607.55	12
St. Louis (receiving ship)	2,348.25	....	116.78	238.09	....	671.48	1,722.43	70,382.79	12
Thetis	5,119.16	135.75	133.86	839.79	2,426.83	562.98	10,532.07	90,321.32	12
Vermont (receiving ship)	8,084.54	166.69	925.64	918.98	568.97	5,749.59	5,824.94	285,262.21	12
Vesuvius	3,327.88	135.48	16,607.23	1,030.91	2,841.42	....	6,376.13	76,457.92	12
Wabash (receiving ship), including Passaic	4,827.64	29.75	1,302.50	607.90	727.54	7,297.10	5,772.40	137,512.56	12
Wabneta	....	....	....	....	....	....	43.08	3,432.35	12
Yantic	5,349.70	86.20	1,622.66	1,376.65	1,116.85	6,700.45	....	92,201.40	12
Yorktown	40,252.80	456.53	3,992.63	2,163.55	6,276.30	8,271.11	26,478.54	192,078.10	12
Total	629,246.27	10,722.47	110,667.50	77,628.98	137,054.89	257,899.98	534,664.67	7,008,731.29	.....

APPENDIX F.

Statement showing the value of supplies on hand July 1, 1892, the receipts from purchase and other sources and the expenditures during the year, and the balance on hand June 30, 1893.

			On hand July 1, 1892, with receipts and expenditures during fiscal year 1893.	Balances on hand June 30, 1893.
Balances on hand:				
Navy-yard, Portsmouth			$969,247.48	$1,036,767.05
Navy-yard, Boston			1,977,414.42	1,889,691.51
Torpedo station, Newport			34,076.80	55,086.50
Naval training station, Newport			1,623.83	2,749.10
Naval station, New London			51,684.80	22,173.69
Navy-yard, New York			3,219,917.66	3,894,241.14
Navy-yard, League Island			894,567.22	887,627.01
Naval Academy, Annapolis			285,265.69	183,020.10
Navy-yard, Washington			1,809,241.14	2,438,612.23
Naval Observatory, Washington			40,749.76	40,749.18
Naval proving ground			45,209.23	63,528.75
Navy-yard, Norfolk			1,384,494.04	1,920,457.23
Naval station, Key West			25,394.45	32,051.90
Navy-yard, Pensacola			618,825.63	613,074.40
Navy-yard, Mare Island			2,707,228.90	2,426,030.21
Naval station Puget Sound			26,263.45	25,733.66
World's Columbian Exposition			....	194,226.21
Shipments between navy-yards in transit			....	467,735.63
Total on hand July 1, 1892			14,091,204.50	
Received during the fiscal year 1893:				
Under Title X—				
From open purchase		$1,561,177.85		
From contracts		2,841,513.52		
From gain by inventory		180,265.82		
From Title Z, manufactured articles		2,279,865.05		
From Titles B and Y, transfers from ships		508,268.82	7,321,091.06	
			21,412,295.56	
Expended during the fiscal year 1893:				
To Title A—For use	$685,630.09			
To Title B—For use	26,923.15			
To Title D—For use	155,662.34			
To Title E—For use	125,580.38			
To Title F—For use	304,156.19			
To Title G—For use	618,561.84			
To Title I—For use	310.48			
To Title N—For use	48,336.90			
To Title O—For use	17,723.27			
To Title V—For use	76,612.57			
To Title Z—For use	1,330,787.32			
		3,390,284.53		
To Title V—Sold to other Departments		13,596.78		
To Title W—Condemned		222,864.49		
To Title W—Revalued		215,205.68		
To Titles B and Y—Transfers to ships		1,376,788.58	5,218,740.06	
Total on hand June 30, 1893			16,193,555.50	16,193,555.50

APPENDIX G.

Statement of payments through the Paymaster-General's Office on contract, open purchase, and open contract vouchers during the year ended June 30, 1893.

Bureau.	Contract.	Open purchase.	Open contract.	Total.	Number of vouchers.
Yards and Docks	$559,487.53	$86,391.18	$21,734.94	$667,613.65	1,973
Equipment	296,835.75	233,517.05	42,288.95	572,641.75	2,202
Navigation	72,581.77	43,529.95	45,047.24	161,158.96	1,065
Ordnance	3,422,599.19	1,120,803.38	48,134.43	4,591,537.00	2,998
Construction and Repair	289,642.73	314,002.01	13,944.07	617,588.81	2,962
Steam Engineering	245,910.26	168,716.25	9,631.93	424,258.44	2,135
Supplies and Accounts	440,524.34	52,221.10	11,098.05	503,843.49	1,100
Medicine and Surgery	80,753.67	70,970.04	21,053.73	172,777.44	1,220
Secretary's Office	7,017,682.99	4,839.46	154,089.37	7,176,611.82	798
Total	$12,426,018.23	2,094,990.42	367,022.71	14,888,031.36	16,453

Purchases under Title X, supplies in store, by Bureaus, for years 1893 and 1892.

Bureau.	1893.	1892.	Increase.	**Decrease.**
Yards and Docks	$217, 861. 04	$401, 158. 46		**$183, 297. 42**
Equipment	287, 087. 34	327, 525. 56		**40, 438. 22**
Navigation	80, 556. 86	87, 286. 97		**6, 730. 11**
Construction and Repair	595, 028. 70	906, 152. 14		**311, 123. 44**
Steam Engineering	387, 288. 95	418, 494. 92		**31, 205. 97**
Supplies and Accounts	474, 221. 75	509, 624. 61		**35, 402. 86**
	2, 042, 044. 64	2, 650, 242. 66		**608, 198. 02**
Ordnance	1, 442, 856. 53	810, 900. 18	631, 956. 35	
Exempt stores	1, 496, 437. 01	1, 215, 332. 13	281, 104. 88	
Total	$4, 981, 338. 18	4, 676, 474. 97	304, 863. 21	

NOTE.- The decrease noted above ($608,198.02) represents the decrease in the purchase of general stores as compared with 1892.

APPENDIX I.

Statement of public sales and report of deposits during the fiscal year 1893 on account of sales of Government property.

Date of sale.	Place of sale.	By whom deposited.	Gross receipts.	Expenses of sale.	Net proceeds.	Credited to miscellaneous receipts.	Credited to appropriations.	
							Clothing and small stores.	Ordnance and ordnance material.
June 1, 1892	League Island	J. N. Speel	$468.67	$150.07	$318.60			$318.60
June 4, 1892	Pensacola	H. T. Skelding	4,718.39	131.30	4,587.09	$120.66		4,466.43
June 7, 1892	Portsmouth	J. Foster	7,269.84	139.74	7,130.10	878.67	$1.40	6,250.03
August 15, 1892	League Island	J. N. Speel	1,916.00	96.00	1,820.00	1,602.00		218.00
October 25 1892	Boston	C. A. McDaniel	8,374.74	299.62	8,075.12	5,851.55		2,223.57
November 17, 1892	New York	A. Burtis	48,993.72	3,993.72	45,000.00	15,580.64	10,432.67	18,986.69
March 15, 1893	Mare Island	H. T. Skelding	5,031.25	293.44	4,737.81	4,737.81		
April 25, 1893	Portsmouth	J. Foster	30.00		30.00	30.00		
May 1, 1893	Mare Island	H. T. Skelding	1,619.88	77.16	1,542.72	519.13	1,023.59	
May 8, 1893	Norfolk	H. T. Stancliff	82.00	15.33	66.67	66.67		
May 31, 1893	Washington	S. Rand	3,063.87	320.58	2,743.29	1,065.91	293.50	1,383.88
			81,568.36	5,516.96	76,051.40	30,453.04	11,751.16	33,847.20

List of purchasers, with amount received from each.

Navy-yard, League Island, Pa., June 1, 1892:

Bussenius & Cunliffe	$242.13
Dreifus & Co	85.87
Frailey & Sons	22.50
E. H. Wilson & Co	118.17
	468.67

Navy-yard, Pensacola, Fla., June 4, 1892:

Francis Bannerman	16.36
Thomas Bannerman	7.68
John Barry	40.00
A. G. Fell	.25
S. Z. Gonzales	16.00
L. K. Hirsch	128.47
E. Levy	68.95
A. Marx	478.11
C. Marks	2.50
J. A. McDonald	.25
A. McMahon	368.14
A. Purvis & Son	496.99
L. V. Reed	3.05
M. Schwartz	3,090.28
Carl Wilson	.59
Charles Wilson	.77
	4,718,39

Navy-yard, Portsmouth, N. H., June 7, 1892:

W. J. Bannerman	16.00
Thomas Butler & Co	3,899.85
S. A. Comey	513.61
W. I. Corbett	51.66
L. T. S. Davis	407.23
C. F. Duncan	75.00
E. L. Fitzgerald	1,156.08
Charles J. Godfrey	101.00
R. C. Goodwin	5.55
J. Mullen	188.16
Nolan Bros	245.80
E. H. Wilson & Co	609.90
	7,269.84

Navy-yard, League Island, Pa., August 15, 1892:

David France	70.87
H. Hitner & Son	50.00
H. A. Hitner & Son	1,202.75
Purvis & Son	592.38
	1,916.00

Navy-yard, Boston, Mass., October 25, 1892:

S. A. Boynton	5.50
Thomas Butler & Co	2,245.53
Samuel Butters	12.00
Thomas Burke	235.74
S. A. Comey	868.93
Dunbar & Davis	329.32
E. L. Fitzgerald	942.54
C. J. Flynn	22.00
Forsaith Machine Co	137.00
Thomas Golding	35.00
C. E. Hull & Co	66.45
McBarron & Co	649.50
Nolan Bros	613.07
James O'Connell	26.00
James Robertson	347.10
S. S. Vinal & Co	1,839.06
	8,374.74

Navy-yard, New York, November 17, 1892:

D. Ahren & Co	52.00
J. C. Abbey	211.48
Thos. Butler & Co	7,248.65
F. Bannerman	3,696.23
W. J. Bannerman	1,235.31
F. A. Browne	20.00
James Boyce	200.00

Navy-yard, New York, November 17, 1892—Continued.

John Bolls	$4.00
Burgass & Co	528.36
S. A. Comey	902.04
Thomas E. Crossley	85.00
James B. Corwine	10.35
Duncan Bros	10.00
Donegan & Swift	450.00
Dunbar & Davis	380.05
Driefus & Co	351.00
Damat & Pell	564.00
John Dunne	2,365.42
Charles Dusenbury	18.00
J. L. Eccles	30.00
Joseph Enderling	160.00
S. C. Frailey & Son	25.00
J. W. Frazier, agent	3,002.97
C. Fischer	2,242.27
Forsaith Manufacturing Co	1,258.50
M. Gill, jr	4,233.52
M. H. Gregory	206.00
Charles J. Godfrey	140.30
Thomas A. Green	147.26
W. Gilmore	22.00
H. A. Hitner & Son	416.76
John Hennessey	50.50
H. F. Hamill	33.00
Thomas Hardcastle	11.50
David Hymes	56.52
Hallet & Sons	330.30
David Jacobs	36.75
James Kelly	35.00
N. Kanes Sons	339.84
F. K. Kingman	176.00
W. S. Kirk	933.00
C. J. Lawless	245.50
D. R. Long, jr	27.00
H. D. Morris	96.25
J. J. Mahoney	548.20
F. Mulhausen & Co	2,250.00
Stephen Maher	30.00
J. H. Mechlin	12.00
James McAllister	48.65
A. McMahon	118.43
Joseph R. McKay	12.75
Nolan Bros	175.80
R. G. Packard	769.64
A. Purves & Son	658.21
W. R. Plyer	92.64
J. W. Roche	25.00
Seligman Brothers	200.93
M. Samuels & Sons	599.56
Shoveling, Daly & Gales	20.00
A. Harry Sanders	23.26
C. H. Townsend	1,511.25
E. M. Townsend	25.10
Jros Tapin	10.00
Joseph Tobin	93.55
H. Tomb	6.00
George Taylor	11.00
H. S. Tompkins	25.00
George Whittaker	8.00
E. N. Walbridge	35.50
John E. Warren	5.00
Walsh Sons & Co	2,880.36
E. H. Wilson & Co	6,210.26
	48,993.72

Navy-yard, Mare Island, Cal., March 15, 1893:

Pantoskey, Bercovich & Co	5,031.25

Navy-yard, Portsmouth, N. H., April 25, 1893:

D. B. Cook	30.00

Navy-yard, Mare Island, Cal., May 1, 1893:

Aden Brothers	247.50
James P. Burke	13.
John F. English	3.
Daniel Henry	198.
W. S. Kirk	707.
J. McKenna	

List of purchasers, with amount received from each—Continued.

Navy-yard, Mare Island, Cal., May 1, 1893—Continued.	
J. Pantosky	$335.90
Michael Regan	112.00
A. M. Stoddard	.25
	1,619.88
Navy-yard, Norfolk, Va., May 8, 1893:	
John A. Codd	61.00
O. L. Williams	21.00
	82.00
Navy-yard, Washington, D.C., May 31, 1893:	
S. A. Bernheimer	$5.00
Julius Dreifus	976.75
F. J. Einstein	149.00
H. Z. Fish	33.00
Lewis Hopfenmeier	325.35
J. B. Kendall	69.67
J. O. A. Kuhn	30.20
S. J. McArdle	671.79
Joseph Rosenthall & Sons	724.21
C. A. Williams	78.90
	3,063.87

RECAPITULATION.

New York	$48,993.72
Pensacola	4,718.39
Portsmouth	7,290.84
League Island	2,384.67
Boston	8,374.74
Mare Island	6,651.13
Norfolk	82.00
Washington	3,063.87
Gross proceeds	81,568.36
Expenses of sales	5,516.96
Net proceeds	76,051.40
Deposited to credit:	
Miscellaneous receipts	30,453.04
Clothing and small stores fund	11,751.16
Ordnance and ordnance material	33,847.20
	76,051.40

APPENDIX J.

SCHEDULE OF PROPOSALS RECEIVED.

*Proposals for fresh provisions and provender for the navy-yard, **Portsmouth, N. H.**, under Bureau advertisement dated May 18, 1892: opened June 10, 1892.*

Class 1.—1,600 pounds fresh beef; 1,600 pounds fresh vegetables:	
James E. Chase*	0.06\frac{22}{100}$ .01$\frac{49}{100}$
Class 2.—1,300 pounds fresh bread:	
James E. Chase	.07
Class 2.—Continued.	
Norton & Co.*	0.05\frac{3}{4}$
Class 3.—Provender:	
Geo. A. Hammond*	1,888.70
James E. Chase	2,115.20
Norton & Co.	1,957.20

*Proposals for fresh provisions and provender for the navy-yard, **Boston, Mass.**, under Bureau advertisement dated May 18, 1892; opened June 10, 1892.*

Class 1.—45,000 pounds fresh beef; 45,000 pounds fresh vegetables:	
G. E. Robinson & Co.	$0.13½ .04
Chas. A. Simonds*	.12½ .03½
M. J. Doran	.14 .04
Class 2.—3,000 pounds fresh bread:	
Geo. A. Sanderson *	.05½
(T. J.) Austin & Graves	.05$\frac{6}{10}$
Class 2.—Continued.	
George C. Stickney	0.06\frac{74}{100}$
Class 3.—10,000 pounds navy biscuit:	
Austin & Graves, in barrels	.03$\frac{44}{100}$
Austin & Graves, in tins	.05$\frac{14}{100}$
George C. Stickney †	.04
Class 4.—28,060 pounds ice:	
Drivers' Union Ice Co.*‡	.005
Boston Ice Co.	.005
Class 5.—Provender:	
John Mullet*	1,759.55

* Accepted. † No award. ‡ By lot.

Proposals for fresh provisions and provender for the naval torpedo station, Newport, R. I., under Bureau advertisement dated May 18, 1892; opened June 10, 1892.

Class 1.—40,000 pounds fresh beef; 40,000 pounds fresh vegetables :	
Patrick Keefe*	$0.07 .02¼
John T. Reagan	.07 .02½
Class 2.—30,000 pounds fresh bread :	
Simeon Davis	.04¼
Class 2.—Continued.	
Jeremiah J. Lynch*†	$0.03½
Class 3.—200,000 gallons fresh water :	
Lawton Coggeshall*	.007
Class 5.—Provender :	
Chas. H. Pleasants	365.90
J. G. Stevens *	324.90

Proposals for fresh provisions and provender for the naval station, New London, Conn., under Bureau advertisement dated May 18, 1892; opened June 10, 1892.

Class 1.—11,500 pounds fresh beef; 11,500 pounds fresh vegetables:	
Chas. H. Klinck*	$0.12½ .03
Class 2.—9,200 pounds fresh bread :	
G. Williams & Son *	$0.04
Class 3.—Provender :	
Chas. H. Pleasants*	425.64

Proposals for fresh provisions and provender for the New York navy-yard, under Bureau advertisement dated May 18, 1892; opened June 10, 1892.

Class 1.—165,000 prounds fresh beef; 165,000 pounds fresh vegetables:	
Michael Cloonen*	0.05\frac{8}{10}$ .00$\frac{65}{100}$
John Harrison	.05½ .00$\frac{3}{10}$
W. H. Evans	.06$\frac{4}{10}$ .01
John Hanley	.05$\frac{2}{10}$ .01
Class 2.—150,000 pounds fresh bread:	
John McNamara	.03¼
John Harrison*	.02$\frac{33}{100}$
John A. Dahn & Son	.03½
Class 3.—200,000 pounds navy biscuit:	
The Treadwell & Harris Baking Co.*	.04$\frac{67}{100}$ .03$\frac{17}{100}$
Class 3.—Continued.	
John Harrison	$0.05½ .02½
New York Biscuit Co.	.05¼ .03½
Chas. T. Goodwin & Son	.04$\frac{84}{100}$ .03$\frac{37}{100}$
Class 4.—Ice, 119,838 pounds:	
Michael Cloonen*	.00$\frac{4}{10}$
John Harrison	.00$\frac{5}{10}$
Class 5.—Provender:	
Charles L. Rickerson*	2,436.15
John Harrison	2,587.62
John A. Dahn & Son	2,881.00
M. Levy & Son	2,609.00
John Moonan	2,438.50
Michael May	3,513.00

Proposals for fresh provisions and provender for the navy-yard, League Island, Pa., under Bureau advertisement dated May 18, 1892; opened June 10, 1892.

Class 1.—6,000 pounds fresh beef; 6,000 pounds fresh vegetables	
L. Shuster Boraef & Co.*	$0.11 .04
Wm. Roesch	.15 .06
Class 2.—4,500 pounds fresh bread:	
L. Shuster Boraef & Co.*	.05
Class 3.—Ice, 76,114 pounds:	
Paul J. Field, jr.*	.00¾
Class 4.—25,000 pounds navy biscuit:	
John Hartman‡	$0.08 .04¼
Class 5.—Provender:	
Robt. McKnights Sons	1,862.50
Wm. Brown*	1,487.60
Ezekiel Dunwoody & Co.	1,640.00
Paul J. Field, jr	2,284.00

Proposals for fresh provisions and provender for the Naval Academy, Annapolis, Md., under Bureau advertisement dated May 18, 1892; opened June 10, 1892.

Class 1.—5,000 pounds fresh beef; 5,000 pounds fresh vegetables:	
Jackson Brewer*	$0.08¼ .04
Class 1.—Continued.	
H. F. Basil	0.08\frac{70}{100}$ .03$\frac{70}{100}$

* Accepted. † By law. ‡ No award.

*Proposals for fresh provisions and provender for the navy-yard, **Washington, D. C.**, under Bureau advertisement dated May 18, 1892; opened June 10, 1892.*

Class 3.—82,810 pounds ice:	
The Independent Ice Co	0.00\frac{36}{100}$
The Hygienic Ice Co.*	.00$\frac{35}{100}$
Class 4.—Provender:	
Richard J. Earnshaw*	1,042.97
Class 4.—Continued.	
M. W. Galt & Co	**$1,071.75**
S. S. Daish & Son	**1,123.89**
Waller I. Hewitt	**1,095.00**

*Proposals for fresh provisions and provender for the navy-yard, Norfolk, Va., **under** Bureau advertisement dated May 18, 1892; opened June 10, 1892.*

Class 1.—50,000 pounds fresh beef; 50,000 pounds fresh vegetables:	
J. Gutman	0.05\frac{60}{100}$ .01$\frac{37}{100}$
L. Waserman	.05$\frac{50}{100}$ .01$\frac{50}{100}$
D. S. Baum*	.04$\frac{94}{100}$ .01$\frac{10}{100}$
E. L. Woodward	.08 .03
Class 2.—50,000 pounds fresh bread:	
F. Rieger	.03⅕
C. T. Cabler*	.03
James Reed & Co	.03¾
Class 2—Continued:	
J. T. Parker & Bro	**$0.05**
Class 3.—50,000 pounds navy biscuit: †	
Chas. T. Goodwin & Son	**.05¼**
Treadwell & Harris Baking Co	**.04$\frac{97}{100}$**
James Reed & Co	**.05$\frac{45}{100}$**
Class 4.—88,985 pounds ice:	
James J. Linnehan*	**$\frac{42}{100}$**
John K. Gann	**$\frac{65}{100}$**
Class 5.—Provender:	
F. L. Grandy*	**1,729.93**
Lindsay & Co	**1,969.30**
C. L. Williams	**2,034.23**
J. T. Parker & Bro	**2,143.10**

*Proposals for fresh provisions and provender for the naval station, Key West, Fla., **under** Bureau advertisement dated May 18, 1892; opened June 10, 1892.*

Class 1.—10,000 pounds fresh beef; 10,000 pounds fresh vegetables:	
S. O. Johnson*	$0.12 .06
Class 2.—8,000 pounds fresh bread:	
S. O. Johnson	**$0.10**
Sanford & Cohn*	**.07½**
Class 3.—14,600 pounds ice:	
S. O. Johnson*	**.02**

*Proposals for fresh provisions and provender for the navy-yard, Pensacola, Fla., **under** Bureau advertisement dated May 18, 1892; opened June 10, 1892.*

Class 1.—3,000 lbs. fresh beef, 3,000 lbs. fresh vegetables:		
John J. Fell	$0.12½	$0.06
Wm. L. Hubbard	.12	.03½
Jeremiah O'Neal	.15	.07
John S. Bell*	.09	.04
Class 2.—2,000 lbs. fresh bread:		
Moses White	.05	
T. Bauer	.06	
Class 2—Continued.		
John S. Bell* ‡	**$0.05**	
Class 3.—47,040 pounds ice:		
Jeremiah O'Neal*	**0.1¼**	
E. E. Saunders §	**0.1¼**	
Cary & Co. §	**0.1¼**	
Class 4.—Provender:		
Jeremiah O'Neal	**$901.05**	
Benj. Dolphin	**852.60**	
B. A. Philibert	**854.21**	
T. Bauer*	**771.55**	

*Proposals for fresh provisions and provender for the navy-yard, Mare Island, **California**, under Bureau advertisement, dated May 18, 1892, opened June 10, 1892.*

Class 1: 100,000 lbs. fresh beef, 100,000 lbs. fresh vegetables	$0.06¾	$0.01¼
Jacob Steffen	.07	.02
Jacob Stutz	.07¼	.01½
Hammond & Brod*	.06$\frac{5}{10}$	.01
Class 2.—100,000 lbs. fresh bread:		
H. G. Witzermann	.04⅕	
Brown & Fleming*	.04	
Class 3.—100,000 Navy biscuit in tins:		
Eclipse Cracker Co	**$0.06¾**	
American Biscuit Co*	**.06¼**	
Class 4.—2.200 lbs. ice:		
Henry Connelly‖ (O. P.)	**.01.95**	
Class 5.—Provender:		
Corcoran & Collins	**$3,518.40**	
James Brownlie*	**3,505.00**	
Louis E. Lake	**3,803.00**	

* Accepted.
† No award for this class.
‡ Decided by lot.
§ Informal.
‖ No award.

Proposals for annual supplies for the Naval Home, Philadelphia, Pa., under Bureau advertisement dated May 19, 1892; opened June 10, 1892.

Class 1.—Brushes:	
J. Jacob Shannon & Co.*	$133.88
Chas. J. Field	184.25
Shoemaker & Busch	145.56
Class 2.—Belgian blocks, etc.:	
A. P. Swoyer & Co.*	304.90
Paul J. Field, jr	362.50
Class 3.—Signal halyards:	
J. Jacob Shannon & Co	36.20
Chas. J. Field*	28.52
Chas. H. Pleasants	41.22
Class 4.—Clothing:	
Wanamaker & Brown*	6,667.00
Garrity, Son & Allen	7,507.00
Jacob Reed's Sons	6,839.50
Class 5.—Boots and shoes:	
Robt. Holland*	1,168.00
John D. Logan	1,467.00
Class 6.—Bedding, etc.:	
Clarkson Clothing	1,252.65
Thos. G. Hood	1,206.59
Class 7.—Coal:	
Frank F. Mathers	3,495.00
Chas. S. Lowry	3,557.50
McBrides Bros.*	3,400.00
Daniel L. Hutchinson, jr	3,625.00
Thomas McConnell	3,733.50
Chas. B. Rees' Son	2,537.50
Class 8.—Firewood:	
Frank F. Mathers	180.75
Chas. S. Lowry*	175.00
J. Jacob Shannon & Co	250.00
Thomas McConnell	375.00
Class 9.—Kitchen furniture:	
J. Jacob Shannon & Co.*	473.73
Chas. J. Field	488.95
Paul J. Field, jr	610.00
Class 10.—Furniture:	
J. Jacob Shannon & Co.*	286.50
Chas. J. Field	388.50
Paul J. Field, jr	327.75
Class 11.—Window glass:	
J. Jacob Shannon & Co	35.15
Chas. J. Field*	34.13
Thompson C. Gill & Co	54.89
Chas. H. Pleasants	60.58
Shoemaker & Busch	37.06
A. P. Swoyer & Co	36.41
John Lucas & Co	39.70
Class 12.—Hardware:	
J. Jacob Shannon & Co	272.75
Chas. J. Fields*	221.70
Paul J. Field, jr	348.44
Class 13.—Lumber:	
Elias Pohl*	$714.60
Chas. P. Maule	782.20
E. A. Gaskill	776.30
Class 14.—Paints:	
J. Jacob Shannon	512.94
Chas. H. Pleasants	566.50
Shoemaker & Busch*	470.65
A. P. Swoyer & Co	583.05
Lewis U. Bean & Co	552.86
John Lucas & Co	517.30
Class 15.—Provender:	
Ezekiel Dunwoody & Co.*	262.50
Wm. Brown	264.80
Chas. H. Pleasants	283.15
Paul J. Field, jr	377.40
Class 16.—Provisions, groceries:	
Samuel A. Sproule	9,100.45
Robt. McKeown*	8,669.20
Class 17.—Provisions, meats, etc.:	
L. Shuster Boraef	9,882.00
Wm. Roesch*	9,153.00
Thos. Bradley	9,659.50
Danl. Snyder & Son	9,172.00
Class 18.—Provisions, bread:	
George W. Wenklen	2,290.00
The Grocers' Baking Co	2,607.50
L. Shuster Boraef	2,552.50
George Goetz*	2,130.00
Class 19.—Tools:	
J. Jacob Shannon & Co.*	69.67
Chas. J. Field	74.03
A. P. Swoyer & Co	94.81
Paul J. Field, jr	161.86
Class 20.—Ice:	
Knickerbocker Ice Co.*†	300.00
Chas. B. Rees' Son	300.00
Class 21.—Soap, etc.:	
Robert McKeown	345.19
Oliver Parker*	335.94
Chas. H. Pleasants	536.63
Shoemaker & Busch	340.64
Class 22.—Harness:	
Thompson C. Gill & Co	23.99
Charles H. Pleasants	22.78
A. P. Swoyer & Co.*	12.00
Class 23.—Hose:‡	
Layn & Austin	385.00
Richard Levicksson & Co.	326.50
Class 24.—Harness blacking:	
Chas. H. Pleasants	24.63
Shoemaker & Busch*	16.30
A. P. Swoyer & Co	22.00

Proposals for sheet iron, etc., for the navy-yards, New York, N. Y., and Norfolk, Va., under Bureau advertisement dated June 15, 1892; opened July 5, 1892.

Class 1.—162,590 pounds sheet iron:	
S. C. Forsaith Machine Co.	$4,861.41
Geo. L. Neville §	3,994.83
Donegan & Swift *	4,259.85
Frank H. Woodruff	5,202.88
A. R. Whiting	4,877.70
Manhattan Supply Co	4,958.99
Class 2.—Angles and shapes:	
S. C. Forsaith Machine Co.	$612.66
George L. Neville	570.96
Frank H. Woodruff*	565.81
A. R. Whiting ‖	563.74
Manhattan Supply Co	686.75
Class 3.—Rivets:	
George L. Neville*	124.87
Frank H. Woodruff	157.50

*Accepted.
† By lot.
‡ No award.
§ Informal.
‖ Failed to execute contract.

Proposals for machine tools, etc., for the navy-yard, Washington, D. C., under Bureau advertisement dated June 14, 1892; opened July 5, 1892.

Class 1.—Vertical boring and turning machines:	
Bement, Miles & Co.	$14,700.00
William Sellers & Co.*	13,800.00
Class 2:	
Bement, Miles & Co.*	12,000.00
Class 3:	
George L. Neville*	787.50
Class 4:	
George L. Neville	650.00
J. R. Bowen*	280.00
Class 5:	
Midvale Steel Co.*	1,856.00
Class 6:	
S. C. Forsaith Machine Co.*	767.23
George L. Neville	1,592.36
Midvale Steel Co.	1,086.08
Class 6.—Continued.	
J. B. Kendall	$868.56
Manhattan Supply Co.	923.57
Class 7:	
S. C. Forsaith Machine Co.	355.34
Midvale Steel Co.	326.00
J. B. Kendall*	285.25
Class 8:	
George L. Neville	25.00
J. B. Kendall*	12.50
Class 9:	
George L. Neville	912.00
A. P. Swoyer*	653.60
Class 10:	
George L. Neville	54.00
J. B. Kendall*	35.10
Manhattan Supply Co.	57.60

Proposals for flannel, etc., for the New York navy-yard, under Bureau advertisement dated July 11, 1892; opened July 26, 1892.

Class 1.—60,000 yards blue flannel, heavy quality:	
Henry F. Kent*	$51,000.00
Tissot & Schultz	73,200.00
Wendell, Fay & Co.	71,280.00
Class 2.—10,000 yards blue cloth for caps:	
Wendell, Fay & Co.	18,310.00
Class 3.—15,000 yards unbleached cotton duck:	
Manhattan Supply Co.	$1,447.50
Tissot & Schultz*	1,410.00
Wm. A. Wheeler	1,468.00

Proposals for provisions for the New York navy-yard, under Bureau advertisement dated July 13, 1892; opened August 2, 1892.

Class 1:	
Francis H. Leggett & Co.	$991.76
Thurber, Whyland & Co.	1,050.56
Chas. E. Ahrens*	950.60
Thos. W. Ormiston	970.05
Rowland & Co.	984.90
Class 2:	
Francis H. Leggett & Co.	1,280.00
Thurber, Whyland & Co.	1,510.00
Chas. E. Ahrens*	1,240.00
Thos. W. Ormiston	1,368.00
H. W. Belford	1,520.00
Class 3:	
Thurber, Whyland & Co.	440.00
Chas. E. Ahrens*	370.00
Thos. W. Ormiston	376.00
Class 4:	
Francis H. Leggett & Co.	75.10
Chas. E. Ahrens*	65.00
Thos. W. Ormiston	67.50
Class 5:	
Chas. E. Ahrens*	135.00
Thos. W. Ormiston	137.50
Class 6:	
Francis H. Leggett & Co.	$900.00
Chas. E. Ahrens	735.00
Louis Bergman	720.00
Henry M. Anthony	708.33
Class 7:	
Francis H. Leggett & Co.*	3,046.00
Class 8:	
Francis H. Leggett & Co.	20,710.00
Charles E. Ahrens†	17,900.00
H. W. Belford*	20,000.00
Class 9:	
Francis H. Leggett & Co.*	893.10
Charles E. Ahrens	975.00
Thomas W. Ormiston	957.30
Robert G. Thomas	1,038.75
Class 10:	
Francis H. Leggett & Co.*	3,156.00
Thurber, Whyland & Co.	3,172.00
Charles E. Ahrens	3,182.00
Thomas W. Ormiston	3,228.00

* Accepted.

† Informal.

Proposals for boilers, etc., for the Naval Academy, Annapolis, Md., under Bureau advertisement dated July 12, 1892; opened August 2, 1892.

Class 1.—Bid 1.	
John Cahill, James Clark & Co	$2,840.00
Thomas C. Basshor & Co	2,790.00
The E. Keeler Co	1,820.38
S. C. Forsaith Machine Co	1,893.00
Campbell & Zell Co	3,074.00
Charles E. Ellicott*	1,812.00
Atlantic Works	2,432.00
H. H. Fauntleroy	1,886.00
Lovegrove & Co	2,046.00
Donegan & Swift	2,228.94
Class 1.—Bid 2.	
John Cahill, Jas. Clark & Co	2,750.00
Thos. C. Basshor & Co	2,740.00
The E. Keeler Co	1,761.34
S. C. Forsaith Machine Co	1,755.00
Campbell & Zell Co	3,024.00
Charles E. Ellicott	1,748.00
Atlantic Works	2,232.00
H. H. Fauntleroy	1,746.00
Lovegrove & Co	2,000.00
Donegan & Swift	2,129.00
Class 2:	
John Cahill, Jas. Clark & Co	305.00
Thos. C. Basshor & Co	387.95
Class 2.—Continued.	
The E. Keeler Co	$265.00
S. C. Forsaith Machine Co.*	248.00
Campbell & Zell Co	350.00
Charles E. Ellicott	319.00
Atlantic Works	370.00
H. H. Fauntleroy	285.00
Lovegrove & Co	350.00
Donegan & Swift	374.00
Class 3:	
Charles H. Classen	35.00
Charles M. McColgan*	26.50
William Wirt Clarke	32.50
A. P. Swoyer	37.40
Class 4:	
Charles H. Classen	382.20
S. C. Forsaith Machine Co.*	355.60
Charles M. McColgan	498.56
William Wirt Clarke	393.72
A. P. Swoyer	578.37
Class 5:	
George N. Potee*	290.00
Charles H. Classen	292.00
Class 6:	
Julius Lansburgh	2,008.10
G. S. Griffith & Co	2,106.25
L. & H. Jones & Co.*	1,934.00
Hall, Headington & Co	2,128.00

Proposals for U. S. Naval Hospital, etc., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 1.—Naval hospital, Portsmouth, N. H.:	
Samuel G. French	$1,395.90
William H. Sise	2,779.30
David S. Wells	1,390.30
J. Albert Walker*	1,286.50
David Duncan & Son	1,337.15
Class 2.—Naval hospital, Chelsea, Mass.:	
Samuel G. French	920.70
Charles A. Campbell*	787.40
J. C. Lewis & Co	880.40
David S. Wells	926.90
J. Albert Walker & Co	906.25
David Duncan & Son	930.00
Class 3.–Naval hospital, Brooklyn, N. Y.:	
Samuel G. French*	3,699.00
Henry W. Peacock	4,088.50
David S. Wells	3,758.50
Scranton and Lehigh Coal Co	3,880.00
David Duncan & Son	3,952.50
Class 4.—Naval hospital, Philadelphia, Pennsylvania:	
Samuel G. French	2,349.60
McBride Bros.*	2,071.40
Henry W. Peacock	2,194.80
Patrick & Lipsett	2,223.60
Jos. B. Van Dusen, jr	2,190.00
David S. Wells	2,295.60
Thomas McConnell	2,301.00
Chas. D. Norton	2,186.10
David Duncan & Son	2,280.00
Class 5.—Dispensary, League Island, Pennsylvania:	
Sam'l G. French	$34.50
Patrick & Lipsett*	27.50
Joseph B. Van Dusen, jr	30.00
David S. Wells	32.00
Thos. McConnell	30.00
Class 6.—Naval hospital, Washington, D. C.:	
George L. Sheriff*	467.20
Johnson Bros	476.00
Stephenson & Bro	500.00
David S. Wells	572.00
Class 7.—Navy-yard dispensary, Washington, D. C.:	
Geo. L. Sheriff*	47.92
Johnson Bros	50.00
Stephenson & Bro	50.00
David S. Wells	57.20
Class 8.—Museum of hygiene, Washington, D.C.:	
George L. Sheriff*	269.50
Johnson Bros	287.50
Stephenson & Bro	312.50
David S. Wells	357.50
Class 9.—Naval hospital, Norfolk, Va.:	
Sam'l G. French	2,088.00
Nottingham & Wrenn Co.*	1,868.00
David S. Wells	2,068.00
S. W. Niemeyer	1,951.60
David Duncan & Son	1,956.00
Nottingham & Wrenn Co.*	31.14

* Accepted.

Proposals for U. S. Naval Hospital, etc.—Continued.

Class 10.—Dispensary, Norfolk, Va.:	
David S. Wells	$44.40
S. W. Niemeyer	38.10
Class 11.—Naval hospital, Mare Island, California:	
J. C. Wilson	$1,678.25
John L. Howard	1,601.25
R. D. Chandler	1,793.75
Henry Rosenfeld*	1,512.00

Proposals for fuel for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 1:	
John H. Broughton	$125.00
J. Albert Walker*	100.00
Class 2:	
John H. Broughton	297.50
Imperial Pine Product Co.*	178.50
Class 3:	
Samuel G. French*	$325.00
John H. Broughton	350.00

Proposals for fuel for the navy-yard, Boston, Mass., under Bureau advertisement dated July 7, 1892: opened August 2, 1892.

Class 4:		
Samuel G. French		$4,386.00
E. B. Townsend*		4,175.00
Chas. A. Campbell		4,272.00
J. Albert Walker & Co		4,410.00
David Duncan & Son		4,806.00
David S. Wells		4,323.00
J. E. Lewis & Co		4,300.00
Henry W. Peacock		4,423.00
Class 5:		
Samuel G. French	A	9,600.00
	B	10,850.00
E. B. Townsend*		8,375.00
Chas. A. Campbell		9,700.00
Curran & Burton		9,275.00
J. Albert Walker & Co		8,625.00
David Duncan & Son		9,550.00
David S. Wells		9,950.00
Henry W. Peacock		9,300.00
Class 6:		
Samuel G. French		5,654.00
E. B. Townsend*		5,500.00
Charles A. Campbell		5,588.00
J. Albert Walker & Co		5,874.00
David Duncan & Son		5,874.00
Class 6—Continued.		
David S. Wells		$5,603.00
J. E. Lewis & Co		5,610.00
Henry W. Peacock		5,709.00
Class 7:		
Charles A. Campbell*†		71.50
J. Albert Walker & Co		71.50
David Duncan & Son		82.50
David S. Wells		79.70
J. E. Lewis & Co		72.08
Class 8:		
Samuel G. French		953.40
E. B. Townsend*		777.00
Charles A. Campbell		814.80
J. Albert Walker & Co		819.00
David Duncan & Son		843.70
Henry W. Peacock		833.90
Class 9:		
Imperial Pine Product Co.		44.00
Taylor P. Thompson*		32.00
Class 10:		
Charles A. Campbell		196.00
Taylor P. Thompson*		181.50
J. E. Lewis & Co		203.00

Proposals for fuel for the torpedo station, Newport, R. I., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 11:	
Samuel G. French	$1,021.00
David Duncan & Son*	988.00
David S. Wells	988.00
Henry W. Peacock	1,054.00
Class 12:	
Samuel G. French	5,965.20
Class 12—Continued.	
David Duncan & Son*	$5,658.00
David S. Wells	5,831.60
Henry W. Peacock	6,196.40
Class 13:	
Samuel G. French*	97.50
David Duncan & Son	112.50

Proposals for fuel for the training station, Newport, R. I., under Bureau advertisemen, dated July 7, 1892 opened August 2, 1892.

Class 14:	
Samuel G. French	$4,474.00
David Duncan & Son*	4,236.00
David S. Wells	4,485.00
Henry W. Peacock	4,633.50
Class 15:	
Samuel G. French	7,568.00
David Duncan & Son*	6,990.00
Class 15—Continued.	
David S. Wells	$7,656.50
Henry W. Peacock	7,897.50
Class 16:	
Samuel G. French*	66.00
Class 17:	
Samuel G. French	6.00
Imperial Pine Product Co.*	4.20

*Accepted

†Decided by lot.

Proposals for fuel for the naval station, New London, Conn., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 18:	
Samuel G. French	$597.00
David Duncan & Son*	562.50
David S. Wells	592.50
Class 18—Continued:	
Henry W. Peacock	$630.00
Class 19:	
Samuel G. French*	19.00

Proposals for fuel for the navy-yard, New York, under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 20:	
Samuel G. French	$26,702.40
David Duncan & Son	26,370.00
David S. Wells*	26,327.80
Barber & Ziegler	26,359.40
Henry W. Peacock	27,656.30
Scranton & Lehigh	26,657.90
Class 21:	
Samuel G. French	1,430.60
David Duncan & Son*	1,421.00
David S. Wells	1,496.60
Barber & Ziegler	1,431.25
Henry W. Peacock	1,527.00
Scranton & Sehigh	1,424.60
Class 22:	
Samuel G. French	19.00
West Virginia Coal Co	13.20
Davis Coal and Coke Co	13.60
David Duncan & Son	19.92
Scranton & Lehigh*	12.76
Class 23:	
Samuel G. French. A	29,400.00
Samuel G. French. B	32,800.00
West Virginia Coal Co	33,000.00
Berwind White Coal Mining Company	32,500.00
David Duncan & Son	27,900.00
David S. Wells	29,800.00
Class 23—Continued.	
Barber & Ziegler	$32,600.00
Henry W. Peacock*	27,800.00
Scranton & Lehigh	28,023.00
Class 24:	
Samuel G. French	8,549.00
West Virginia Coal Co	8,497.50
Berwind White Coal Mining Company	8,368.75
Davis Coal and Coke Co	8,755.00
David Duncan & Son	8,446.50
Barber & Ziegler	9,398.75
Henry W. Peacock*	8,162.75
Scranton & Lehigh	8,214.25
Class 25:	
Samuel G. French	1,623.60
Imperial Pine Product Co	1,778.90
Daniel Bertolet*	1,528.89
David Duncan & Son	2,525.60
Class 26:	
Samuel G. French	1,191.20
West Virginia Coal Co	1,115.00
David Duncan & Son	1,495.00
Scranton & Lehigh	1,261.40
Class 27:	
Samuel G. French*	267.00
Max Morganstern	306.00

Proposals for fuel for the navy-yard, League Island, Pennsylvania, under Bureau advertisement, dated July 7, 1892; opened August 2, 1892.

Class 28:	
Samuel G. French	$3,391.40
Joseph B. Van Dusen, jr.*	2,989.00
David Duncan & Son	3,552.50
David S. Wells	3,046.40
Patrick & Lipsett	3,002.30
Charles D. Norton	3,024.30
Henry W. Peacock	3,183.30
Thomas McConnell	3,702.50
Class 29:	
Samuel G. French	3,570.80
Joseph B. Van Dusen, jr.*	3,142.40
Class 29—Continued.	
David Duncan & Son	$3,737.00
David S. Wells	3,237.50
Patrick & Lipsett	3,153.40
Charles D. Norton	3,182.90
Henry W. Peacock	3,345.40
Class 30:	
Joseph B. Van Dusen, jr	287.50
David Duncan & Son	300.00
Patrick & Lipsett*	242.25
Thomas McConnell	275.00

Proposals for fuel for the Naval Academy, Annapolis, Md., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 31:	
David Duncan & Son	$180.00
Joseph S. M. Basil*	149.70
Henry B. Myers	152.40
Class 32:	
William L. Read	678.00
Class 32—Continued.	
West Virginia Central and Pittsburg Railway Company*	$660.00
Lynah & Read	660.00
David Duncan & Son	690.00

*Accepted.

Proposals for fuel for the Naval Academy, Annapolis, Md., etc.—**Continued.**

Class 32—Continued.	
David S. Wells	$758.00
Joseph S. M. Basil	698.00
Maryland Coal Co.	698.00
Class 33:	
David Duncan & Son	1,048.00
David S. Wells	1,108.00
Joseph S. M. Basil*	$998.00
Henry B. Myers	1,016.00
Henry W. Peacock	1,038.00
Class 34:	
William L. Read	13,914.00
Class 34—Continued.	
Ehlen Bros	$13,320.00
West Virginia Central and Pittsburg Railway Company	13,320.00
Lynah & Read	13,230.00
David Duncan & Son*	12,975.00
David S. Wells	13,845.00
Henry W. Peacock	14,106.00
Class 35:	
Joseph S. M. Basil	139.20
Henry B. Myers	135.00

Proposals for fuel for the navy-yard, Washington, D. C., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 36:	
William L. Read	$515.00
Johnson Bros	535.00
David Duncan & Son	559.00
David S. Wells	698.00
Henry W. Peacock*	508.00
Class 37:	
William L. Read*	2,652.00
V. Baldwin Johnson	2,669.00
David Duncan & Son	3,085.50
Class 38:	
William L. Read	8,060.00
Johnson Bros.*	7,476.00
David Duncan & Son	7,826.00
David S. Wells	10,072.00
George L. Neville	7,586.00
Class 39:	
David Duncan & Son*	97.50
David S. Wells	112.50
Class 40:	
William L. Read	3,432.00
Class 40—Continued.	
Johnson Bros	$3,792.00
V. Baldwin Johnson	3,454.00
Pocahontas Coal Co.*	3,311.00
David Duncan & Son	3,652.00
David S. Wells	3,869.00
Class 41:	
William L. Read	15,600.00
Johnson Bros	17,250.00
V. Baldwin Johnson	15,700.00
Pocahontas Coal Co.*	15,050.00
David Duncan & Son	16,600.00
Class 42:	
Johnson Bros.*	207.00
Class 43:	
Imperial Pine Product Co.	1,750.00
John F. Clarke*	999.00
George L. Neville	3,000.00
Class 44:	
Johnson Bros.*	890.00

Proposals for fuel for the navy-yard, Norfolk, Va., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 45:	
S. W. Niemeyer	$463.80
Nottingham & Wrenn Co.	393.45
Class 46:	
S. W. Niemeyer	77.76
Nottingham & Wrenn Co.*	68.28
Class 47:	
S. W. Niemeyer	591.00
Nottingham & Wrenn Co.*	487.00
Class 48:	
Samuel G. French†	11,152.00
Pocahontas Coal Company*	10,867.50
David Duncan & Son	11,557.50
David S. Wells	11,971.50
Class 48—Continued.	
Henry W. Peacock	$12,213.00
Class 49:	
Nottingham & Wrenn Co.*	995.75
Class 50:	
Samuel P. Oast	135.00
S. W. Neimeyer*	134.10
George L. Neville	148.50
Class 51:	
Imperial Pine Product Co.	942.00
Samuel P. Oast	980.00
A. H. Bass*	739.50
S. W. Niemeyer	844.27
George L. Neville	832.95

Proposals for fuel for the naval station, Key West, Fla., under Bureau advertisement dated July, 7, 1892; opened August 2, 1892.

Class 52:	
Samuel G. French	$11,960.00
David Duncan & Son*	11,360.00
S. M. Hamilton	$12,900.00
Class 52.—Continued.	
Albert J. Morris	$11,460.00
Henry W. Peacock	11,960.00

*Accepted.

† Informal.

Proposals for fuel for the navy-yard, Pensacola, Fla., under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 53:	
Benjamin Dolphin	$110.00
E. W. Atsinger*	$103.20

Proposals for fuel for the navy-yard, Mare Island, California, under Bureau advertisement dated July 7, 1892; opened August 2, 1892.

Class 54:	
Imperial Pine Product Co.	$600.00
Aden Bros.*	345.00
Wm. Walker	505.00
A. S. Carman	420.00
Class 55:	
Aden Bros	650.00
Wm. Walker*	555.00
A. Powell	$737.00
Class 56:	
Scott & Greenburg*	1,530.00
Wm. Walker	1,922.50
A. S. Carman	1,975.00
John L. Howard	1,662.50
A. Powell	1,970.00

Proposals for lumber, etc., for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated July 18, 1892; opened August 9, 1892.

Class 1.—Steel, etc.:	
S. C. Forsaith Machine Co.*	$82.20
Class 2.—Valves, etc.:	
Manhattan Supply Co	364.77
S. C. Forsaith Machine Co.	179.67
Class 3.—Cement, etc.:	
John H. Broughton*	74.80
Class 4.—Plank:	
Ansel W. Payne	140.00
John H. Broughton*†	140.00
Class 5.—Calcium:	
Aquila Rich*	150.00
Class 6.—Pulleys:	
Clarence F. McMurray*	$85.50
Manhattan Supply Co	118.00
S. C. Forsaith Machine Co.	126.00
Class 7.—Slate:	
Ansel W. Payne	467.50
John H. Broughton*	411.95
S. C. Forsaith Machine Co.	462.00
Class 8.—Lumber:	
Ansel W. Payne	685.00
John H. Broughton*	409.00

Proposals for boilers, etc., for the navy-yard, League Island, Pennsylvania, under Bureau advertisement dated July 22, 1892; opened August 9, 1892.

Class 1.—Boilers:	
J. P. Morris & Co	$7,200.00
Southwark Foundry and Machine Co	7,139.00
R. H. Hammond & Co	9,145.94
John Bagly	5,674.00
Robt. J. Gray	6,495.00
Warden Manufacturing Co.	8,776.00
Coatesville Boiler Works*	5,222.72
Donegan & Swift	6,679.00
Class 2.—Rivets:	
Chas. J. Field	42.75
Paul J. Field, jr	48.75
A. P. Swoyer & Co.*	41.12
Manhattan Supply Co	56.50
Class 3.—Forges, etc.:	
A. P. Swoyer & Co.*	294.94
Donegan & Swift‡	105.00
Class 4.—Iron:	
Chas. J. Field	116.25
Paul J. Field, jr	119.65
S. C. Forsaith Machine Co.	126.25
A. P. Swoyer & Co*	114.32
Thompson C. Gill & Co	$143.50
Manhattan Supply Co	130.90
Donegan & Swift	143.75
Geo. L. Neville	127.55
Class 5.—Cement:	
Howard Fleming*	26.00
A. P. Swoyer & Co	55.92
Geo. L. Neville	40.00
Class 6.—Lumber:	
Edwin A. Gaskill*	198.00
Geo. L. Neville	224.40
Class 7.—Hose:	
Harry L. Briggs	98.00
Boston Woven Hose and Rubber Co	100.00
Gutta-Percha and Rubber Manufacturing Co	110.00
A. P. Swoyer & Co	170.00
Manhattan Supply Co	128.00
Richard Levicksson & Co.	113.00
Geo. L. Neville*	88.00
Aquila Rich	150.00

* Accepted. † Decided by lot. ‡ Withdrawn.

Proposals for naval supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated July 20, 1892; opened August 9, 1892.

Class 1.—Steel plates:	
Carnegie Steel Co.*	$36.00
Geo. L. Neville	96.00
Class 2.—Steel shapes:	
Carnegie Steel Co.*	89.37
Geo. L. Neville	275.00
Class 3.—Fire bricks:	
Ira B. White*	41.85
S. C. Forsaith Machine Co.	63.00
Geo. L. Neville	60.00
Class 4.—Iron:	
Thompson C. Gill & Co	26.00
S. C. Forsaith Machine Co.	22.10
Geo. L. Neville*	18.20
Class 5.—Burring machine:	
M. M. Buck & Co	60.95
Tissot & Schultz*	56.89
Ira B. White	67.25
Geo. L. Neville	57.15
Class 6.—Stake:	
M. M. Buck & Co	57.00
Tissot & Schultz	51.58
Ira B. White	55.75
Geo. L. Neville*	51.00
Class 7.—Brushes:	
M. M. Buck & Co	186.50
Ira B. White	218.90
Manhattan Supply Co	77.90
Geo. L. Neville	53.00
Class 8.—Plaster:	
S. W. Niemeyer	77.20
Ira B. White	53.50
Geo. L. Neville	76.00
Class 9.—Pulley, etc.:	
M. M. Buck & Co	31.00
Tissot & Schultz	27.50
S. C. Forsaith Machine Co.*	23.50
Geo. L. Neville	31.75
Class 10.—Boiler plates:	
S. C. Forsaith Machine Co.*	$107.27
Manhattan Supply Co	155.35
Geo. L. Neville	110.97
Class 11.—Iron:	
S. C. Forsaith Machine Co.	95.25
Geo. L. Neville*	80.90
Class 12.—Paints:	
Smith, Kline & French Co.	174.75
Chas. M. Childs & Co	78.32
Ira B. White	180.50
Manhattan Supply Co	203.75
Fiske Bros	182.63
Aquila Rich	178.63
Geo. L. Neville	188.75
Class 13.—Lard oil:	
Smith, Kline & French Co.	34.75
Chas. M. Childs & Co	33.00
Ira B. White*	29.50
Fiske Bros	34.00
Geo. L. Neville	32.50
Class 14.—Tubing, etc.:	
Ira B. White	24.00
Geo. L. Neville*	18.00
Class 15.—Typewriter:	
Samuel W. Parnell* †	105.00
Tissot & Schultz	105.00
Geo. L. Neville	120.00
Class 16.—Tools:	
Harry L. Briggs	67.17
M. M. Buck & Co	55.42
Tissot & Schultz	58.61
Ira B. White*	47.86
Geo. L. Neville	56.49
Class 17.—Alcohol:	
Smith, Kline & French Co.*	35.17
Aquila Rich	35.25

Proposals for naval supplies for the New York navy-yard, under Bureau advertisement dated July 19, 1892; opened August 9, 1892.

Class 1.—5,000 watch caps:	
Samuel Barron	$1,997.50
B. Z. Pippey & Co	5,950.00
Horstmann Bros. & Co	2,025.00
Tissot & Schultz	2,250.00
Geo. V. B. Clark*	1,917.00
Manhattan Supply Co	1,970.00
Class 2.—20,000 pairs woolen socks:	
B. Z. Pippey & Co	2,125.00
Joseph Wechsler	2,123.00
Tissot & Schultz	7,000.00
Class 3.—2,000 mattresses:	
Wm. F. Bernstein ‡	5,691.80
Walter Bocklowitz	7,000.00
Harry D. Dougherty	5,869.40
J. W. W. Moyer	6,160.00
Joseph Wechsler	5,799.60
Thomas M. Farley	5,880.00
Clarkson, Clothier	5,810.00
Tissot & Schultz	6,200.00
Manhattan Supply Co	6,460.00
Class 4.—1,500 covers:	
Wm. F. Bernstein	$2,877.05
Walter Bocklowitz	2,671.87
Harry D. Dougherty	2,687.85
Joseph Wechsler	2,621.25
Tissot & Schultz	3,150.00
Manhattan Supply Co	3,015.00
Class 5.—Blankets:	
S. Allen Evans	12,187.50
B. Z. Pippey & Co	11,175.00
Tissot & Schultz	12,500.00
Manhattan Supply Co.*	10,975.00
Class 7.—1,000 yards cloth, trousers:	
B. Z. Pippey & Co.*	23,400.00
Class 8.—10,000 spools silk:	
Hans Hemken	333.00
Joseph Wechsler	300.00
Wm. H. Wheeler*	287.00
Tissot & Schultz	299.00

* Accepted. † By lot. ‡ Canceled.

Proposals for naval supplies for the New York navy-yard, etc.—Continued.

Class 9.—3,000 rubber buttons (small):	
India Rubber Comb Co.* †	$109.50
Hans Hemken	111.90
Joseph Wechsler	112.50
Thos. G. Hood	110.70
Tissot & Schultz	109.50
Manhattan Supply Co	111.90
Class 10.—2,000 scrub brushes:	
Thos. S. Messer	355.00
Smith, Kline & French Co.	Informal
J. B. Morrell & Co	359.40
Joseph Wechsler	350.00
Tissot & Schultz * ‡	350.00
Harry L. Briggs	359.00
Manhattan Supply Co	378.00
Class 11.—Twills, etc.:	
Hans Hemken *	435.35
Joseph Wechsler	437.75
Wm. H. Wheeler	471.90
Tissot & Schultz	427.50
Manhattan Supply Co	442.00
Class 12.—Spool cotton:	
Hans Hemken	486.00
Joseph Wechsler *	346.41
Wm. H. Wheeler	394.11
Tissot & Schultz	380.70
Manhattan Supply Co	378.00
Class 13.—Button-hole twist:	
Hans Hemken	49.80
Joseph Wechsler	39.00
Wm. A. Wheeler	36.00
Tissot & Schultz * †	36.00
Class 14.—Silk laces:	
Hans Hempken	127.15
Joseph Wechsler	98.04
Tissot & Schultz*	82.13
Class 15.—Bone buttons:	
Hans Hempken	51.00
Joseph Wechsler	25.00
Wm. A. Wheeler	28.00
Tissot & Schultz * †	24.00
Manhattan Supply Co	24.00
Class 16.—Rubber buttons:	
India Rubber Comb Co.*	276.25
Hans Hempken	297.00
Joseph Wechsler	312.50
Thos. G. Hood	287.35
Tissot & Schultz	280.00
Manhattan Supply Co	295.00
Class 17.—Ivory buttons:	
Hans Hempken	70.00
Joseph Wechsler	62.50
Thos. G. Hood*	38.30
Tissot & Schultz	50.00
Manhattan Supply Co	59.70
Class 18.—Cap device buttons:	
D. Evans & Co. *	66.67
Hans Hempken	108.00
Class 19.—Cap leathers:	
Hans Hemken	138.00
Joseph Wechsler	95.00
Tissot & Schultz*	90.00
Class 20.—Granite:	
Lawrence J. Dooley	3,997.35
Jas. Symington	1,619.40
Manhattan Supply Co	4,507.65
Class 21.—Lumber:	
Chas. E. Pell	$438.15
Jos. W. Duryee	503.00
Watson & Pittinger*	422.00
Manhattan Supply Co	555.20
Class 22.—Lumber:	
Chas. E. Pell	821.70
Jos. W. Duryee	827.40
Watson & Pittinger*	774.00
Class 23.—Mirrors:	
Hans Hempken	91.08
Joseph Wechsler	94.82
Wm. A. Wheeler	126.75
Manhattan Supply Co.*	90.70
Class 24.—Lumber:	
Chas. S. Conner	2,850.00
Jos. W. Duryee	2,226.00
Watson & Pittinger*	2,161.50
C. F. Hodsden	2,210.00
Class 25.—Pipe, etc.:	
Wm. A. Wheeler	451.12
Fred. Stone & Co.*	433.72
A. P. Swoyer	471.64
Donegan & Swift	516.16
S. C. Forsaith Machine Co.	525.50
Manhattan Supply Co	505.64
Class 26.—Tools:	
Donegan & Swift	283.27
Henry S. Manning*	219.83
Tissot & Schultz	241.48
Harry L. Briggs	235.51
Manhattan Supply Co	242.84
Class 27.—Indicators:	
Crosby Steam Gauge and Valve Co.*	1,140.00
Hans Hemken	1,649.52
A. P. Swoyer	3,048.00
Henry S. Manning	1,440.00
Class 28.—Clocks, etc.:	
Crosby Steam Gauge and Valve Co	1,040.00
Wm. A. Wheeler	1,340.00
A. P. Swoyer	1,163.20
Henry S. Manning*	923.00
Manhattan Supply Co	1,184.80
Class 29.—Thermometers:	
Crosby Steam Gauge and Valve Co	200.00
Hans Hemken*	158.00
Wm. A. Wheeler	180.00
Class 30.—Brass cocks:	
A. P. Swoyer	134.08
Donegan & Swift	126.40
Henry S. Manning*	116.48
S. C. Forsaith Machine Co.	129.60
Manhattan Supply Co	127.01
Class 31.—Valves:	
Crosby Steam Gauge and Valve Co	Informal.
Fred. Stone & Co.*	8,182.90
A. P. Swoyer	8,891.51
Donegan & Swift	9,526.90 9,331.46
Class 32.—Twine, etc.:	
J. B. Morrell & Co	299.75
Joseph Wechsler	274.80
Tissot & Schultz	280.00
Manhattan Supply Co.*	271.20

* Accepted.

† Decided by lot.

Proposals for naval supplies for the New York navy-yard, etc.—Continued.

Class 33.—Muslin, etc.:	
Joseph Wechsler*	$250.00
Wm. A. Wheeler	268.50
Tissot & Schultz	252.50
Manhattan Supply Co	252.00
Class 34.—Bunting:	
J. B. Morrell & Co	4,479.20
Wm. A. Wheeler	5,673.20
Tissot & Schultz*	4,287.50
Manhattan Supply Co	5,040.80
Class 35.—Thread, etc.:	
Joseph Wechsler	413.49
Wm. A. Wheeler	423.08
Tissot & Schultz	388.07
Manhattan Supply Co.*	381.49
Class 36.—Scales, etc.:	
J. B. Morrell & Co	164.70
Henry S. Manning*	160.00
Tissot & Schultz	204.00
Harry L. Briggs	176.16
Manhattan Supply Co	205.00
Class 37.—Lamps, etc.:	
Wm. Porters Sons*	2,291.42
Tissot & Schultz	2,297.00
Manhattan Supply Co	2,440.76
Class 38.—Beeswax, etc.:	
Chas. M. Childs & Co	448.75
Fiske Bros.*	371.50
J. B. Morrell & Co	418.50
Wm. A. Wheeler	541.00
Tissot & Schultz	483.00
Harry L. Briggs	451.00
Manhattan Supply Co	404.00
Class 39.—Lard oil:	
Fiske Bros.*	5,280.00
Blivin & Carrington	5,800.00
Smith, Kline & French Co	6,320.00
Manhattan Oil Co	5,410.00
T. J. Gilroy & Co.†	5,200.00
Class 40.—Kerosene:	
Fiske Bros	591.00
Manhattan Oil Co	600.00
Borne, Scrymser & Co	630.00
Manhattan Supply Co	612.00
Class 41.—Lubricating oil:	
Fiske Bros	624.00
Bliven & Carrington*	576.00
Manhattan Oil Co	861.00
T. J. Gilroy & Co.†	456.00
Class 42.—Cylinder oil:	
Fiske Bros	198.00
Bliven & Carrington	240.00
Chas. K. Smith & Co.	172.50
Manhattan Oil Co	402.00
Borne, Scrymser & Co	321.00
T. J. Gilroy & Co	204.00
Class 43.—Grommets:	
Henry S. Manning	21.36
Tissot & Schultz	21.48
Harry L. Briggs*	20.04
Manhattan Supply Co	23.16
Class 44.—Beeswax, etc.:	
Fiske Bros.*	303.00
J. B. Morrell & Co	331.00
Wm. A. Wheeler	341.50
Tissot & Schultz	322.00
Manhattan Supply Co	333.00
Class 45.—Anchors:	
J. B. Morrell & Co	$1,356.78
Henry S. Manning*	1,336.60
Tissot & Schultz	1,885.20
Manhattan Supply Co	1,627.60
Class 46.—Brushes.	
Thos. S. Messer	1,330.00
J. B. Morrell & Co	1,494.45
Tissot & Schultz	1,596.00
Harry L. Briggs	1,411.50
Manhattan Supply Co	1,194.50
Class 47.—Cotton canvas:	
J. P. Morrell & Co	6,371.25
Wm. A. Wheeler	6,688.75
Tissot & Schultz	6,406.50
Manhattan Supply Co	6,291.50
Class 48.—Flax canvas:	
J. B. Morrell & Co	2,853.74
Tissot & Schultz	2,634.50
Manhattan Supply Co	2,735.00
Class 49.—Knives, etc.:	
Tissot & Schultz	803.46
Harry L. Briggs	690.41
Manhattan Supply Co.*	667.79
Class 50.—Coal baskets:	
Aquila Rich	704.84
Tissot & Schultz	830.64
Manhattan Supply Co.*	640.40
Class 51.—Bellows	
Henry S. Manning*	201.84
Tissot & Schultz	224.00
S. C. Forsaith Machine Co	307.08
Manhattan Supply Co	220.80
Class 52.—Hose:	
Revere Rubber Co	4,257.50
Aquila Rich*	3,560.15
J. B. Morrell & Co	3,818.30
Wm. A. Wheeler	3,720.82
New Jersey Car Spring and Rubber Co	4,439.00
Harry L. Briggs	3,566.00
Gutta-Percha and Rubber Co	5,134.10
Manhattan Supply Co	3,628.00
Class 53.—Hooks:	
J. B. Morrell & Co	346.25
Tissot & Schultz	365.25
Harry L. Briggs	327.75
Manhattan Supply Co	349.50
Class 54.—Axes:	
Henry S. Manning	50.16
Tissot & Schultz*	38.40
Harry L. Briggs	54.72
Manhattan Supply Co	41.76
Class 55.—Rope:	
Hans Hemken*	262.80
J. B. Morrell & Co	293.50
Tissot & Schultz	290.50
Manhattan Supply Co	300.60
Class 56.—Candle stands:	
Tissot & Schultz	85.00
Harry L. Briggs	53.50
Manhattan Supply Co	73.50
Class 57.—China ware	
Wm. A. Shaw	1,436.72
Class 58.—Lenses	
Henry S. Manning	929.10
Manhattan Supply Co.*	923.60

*Accepted.

†Not considered.

Proposals for naval supplies for the navy-yard, Mare Island, California, under Bureau advertisement dated July 21, 1892 opened August 16, 1892.

Class 1:	
S. C. Forsaith Machine Co.	$1,417.39
Carnegie Steel Co., l't'd*.	877.93
Miller, Sloss & Scott	1,013.32
Class 2:	
S. C. Forsaith Machine Co.	733.38
Carnegie Steel Co., l't'd.	508.99
Miller, Sloss & Scott	764.02
Class 3:	
E. Detrick*	330.00
Miller, Sloss & Scott	390.00
Class 4:	
Manhattan Supply Co	361.00
Louis E. Lake	357.35
Miller, Sloss & Scott*	300.65
Class 5:	
Manhattan Supply Co.*	4,080.00
Louis E. Lake	4,124.50
J. B. Morrell & Co.†	3,628.00
Class 6:	
Manhattan Supply Co.*	19.00
M. M. Buck & Co	27.25
Miller, Sloss & Scott	23.25
Class 7:	
Manhattan Supply Co	816.00
M. M. Buck & Co.*	687.00
J. B. Morrell & Co.†	792.00
Class 8:	
Aden Brothers*	170.00
Louis E. Lake	235.00
A. Powell	200.00
Class 9:	
Boston Woven Hose and Rubber Co	Informal.
M. M. Buck & Co	52.00
Miller, Sloss & Scott*	36.25
Class 10:	
Manhattan Supply Co	570.00
Louis E. Lake*	475.00
J. B. Morrell & Co	585.00
Miller, Sloss & Scott	545.00
Class 11:	
Manhattan Supply Co	220.00
H. S. Crocker & Co.*	162.50
Miller, Sloss & Scott	246.02
Class 12:	
Manhattan Supply Co.*	194.60
Class 12—Continued.	
Louis E. Lake	$212.60
Miller, Sloss & Scott	246.02
Class 12:	
Manhattan Supply Co.*	194.60
Louis E. Lake	212.60
Class 13:	
Manhattan Supply Co	12.00
Mack & Co.	20.00
M. M. Buck & Co.*	10.00
S. C. Forsaith Machine Co.	96.00
Louis E. Lake	25.00
Miller, Sloss & Scott	19.60
Class 14:	
Manhattan Supply Co	70.00
Mack & Co	65.00
Louis E. Lake*	59.50
Miller, Sloss & Scott	64.75
Class 15:	
Chas. M. Yates	695.00
W. F. Whittier*	670.00
Woodbury Oil Co	800.00
Class 16:	
Boston Woven Hose and Rubber Co.*	46.71
M. M. Buck & Co	108.00
Wm. F. Bowers	54.00
Class 17:	
Manhattan Supply Co.*	55.50
Louis E. Lake	67.50
J. B. Morrell & Co	56.25
Miller, Sloss & Scott	89.25
Class 18:	
M. M. Buck & Co	69.80
Louis E. Lake	30.50
Miller, Sloss & Scott*	17.50
Class 19:	
Boston Woven Hose and Rubber Co	Informal.
Manhattan Supply Co	53.10
M. M. Buck & Co	335.40
Miller, Sloss & Scott*	38.70
Class 20:	
Manhattan Supply Co	31.20
M. M. Buck & Co	84.00
Louis E. Lake	54.00
Miller, Sloss & Scott*	24.00

Proposals for shafting, etc., for the League Island navy-yard, under Bureau advertisement dated August 17, 1892; opened September 8, 1892.

Class 1.—Shafting:	
Geo. V. Cresson Co	$895.38
Manhattan Supply Co	1,056.50
Donegan & Swift	1,231.12
Clarence F. McMurray*	878.84
Class 1—Continued:	
Chas. J. Field	$941.00
S. C. Forsaith Machine Co.	974.60
Wm. Sellers & Co	914.76
McFadden Co	1,010.89

Proposals for hemp, etc., for the navy-yard, Boston, Mass., under Bureau advertisement dated August 19, 1892; opened September 8, 1892.

Class 1.—100 tons manila hemp:	
Manhattan Supply Co.*	$17,310.00
Class 2.—50 tons Russian hemp:	
Manhattan Supply Co	8,700.00
Richard H. Weld	8,712.50
G. Rau*	8,510.00
Class 3.—15 tons American hemp:	
H. B. Nelson & Bro	$2,655.00
Manhattan Supply Co	3,135.00
Richard H. Weld	2,955.00
R. C. Morgan & Co.*	2,553.60

* Accepted.

Proposals for hemp, etc., for the navy-yard, Boston, Mass., etc.—Continued.

Class 4.—Tar:	
Geo. L. Neville*	$224.00
Manhattan Supply Co	310.00
R. G. Lofters	300.00
Class 5.—2,000 yards canvas:	
Geo. L. Neville	1,000.00
Manhattan Supply Co	1,069.80
J. B. Morrell & Co	1,010.00
Tissot & Schultz*	700.00
Class 1.—Hose: †	
The Revere Rubber Co	408.60
Aquila Rich	528.00
Henry Walke	654.00
A. P. Swoyer & Co	825.00
Chas. H. Pleasants	888.00
Manhattan Supply Co	498.00
Boston Woven Hose and Rubber Co	795.00
Norfolk Supply Co	561.00
Ira B. White	711.00
Wm. A. Wheeler	648.00
Geo. L. Neville	615.00
Smith Courtney Co	696.00
Harry L. Briggs	532.50
Melville Lindsay	478.50
Gutta-Percha and Rubber Co	438.00
The N. J. Car Spring and Rubber Co	744.00
Class 2.—Hose: †	
Henry Walke	$250.00
Manhattan Supply Co	147.50
Boston Woven Hose and Rubber Co	130.00
Norfolk Supply Co	225.00
Ira B. White	74.00

Class 2—Continued.	
Geo. L. Neville	$175.00
E. S. Tweedy	132.00
Melville Lindsay	135.00
Class 3.—Pipe, etc.:	
Henry Walke	487.76
A. P. Swoyer & Co	434.99
Ford & Kendig Co.*	419.21
Manhattan Supply Co	459.13
Norfolk Supply Co	460.69
Ira B. White	480.08
Geo. L. Neville	448.99
Smith Courtney Co	788.98
Tissot & Schultz	498.38
S. C. Forsaith Machine Co.	490.29
E. S. Tweedy	461.48
Class 4.—Cotton canvas:	
A. P. Swoyer & Co	199.65
Manhattan Supply Co	248.89
Norfolk Supply Co	219.61
Ira B. White	251.56
Geo. L. Neville	219.48
Tissot & Schultz*	199.52
Class 5.—White pine logs:	
Edwin A. Gaskill	690.00
Geo. L. Neville	661.00
Chas. J. Conner	780.00
Class 6.—Linseed oil:	
Aquila Rich	21.00
Henry Walke	20.16
A. P. Swoyer & Co	20.58
Chas. H. Pleasants	20.58
Chas. M. Childs & Co.*	18.48
Norfolk Supply Co	18.90
Ira B. White	19.32
Geo. L. Neville	19.74

Proposals for ordnance supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated August 23, 1892; opened August 23, 1892.

Class 1.—Rubber rings:	
Manhattan Supply Co	$249.00
Charles H. Pleasants	179.90
The Boston Woven Hose and Rubber Co	250.00
The N. J. Car Spring and Rubber Co.*	160.00
Harry L. Briggs	271.00
Aquila Rich	280.00
Class 2.—Brushes, etc.:	
White & Dodson	127.00
Manhattan Supply Co	89.75
A. P. Swoyer & Co	128.29
J. W. Paxon & Co.*	87.50
Harry L. Briggs	97.95
Class 3.—Crucibles, etc.:	
George L. Neville	425.00
Manhattan Supply Co.	248.00
A. P. Swoyer & Co	387.90
Charles H. Pleasants	135.00
J. B. Kendall	339.50
S. C. Forsaith Machine Co.	315.25
McFadden Co	302.69
Harry L. Briggs	112.00
Class 4.—Copper:	
Manhattan Supply Co	17,775.00

Class 4—Continued.	
J. B. Kendall	$18,000.00
J. Friedenstein*	17,400.00
S. C. Forsaith Machine Co.	17,955.00
Class 5.—Zinc and tin:	
George L. Neville	3,950.00
White & Dodson	3,617.00
Manhattan Supply Co	4,450.00
Charles H. Pleasants	3,746.50
J. B. Kendall	3,485.00
J. Friedenstein*	3,258.50
J. H. Chesley & Co	3,391.50
Class 6.—Forgings:	
The Bethlehem Iron Co.*	5,101.80
The Midvale Steel Co	5,268.64
Class 7.—White pine:	
Edwin A. Gaskill*	710.00
Class 8.—Antimony:	
White & Dodson	80.00
Manhattan Supply Co	70.00
A. P. Swoyer & Co	62.00
Charles H. Pleasants	67.50
J. B. Kendall	58.25
J. Friedenstein	56.70
J. H. Chesley & Co	62.25
Smith, Kline & French*	44.37

* Accepted.

† To be readvertised.

Proposals for ordnance supplies for the navy-yard, Washington, D. C., etc.—Continued.

Class 9.—Packing, etc.:	
White & Dodson	$96.00
Manhattan Supply Co	74.00
J. B. Kendall	96.50
Tissot & Schultz	84.00
Harry L. Briggs	61.50
Class 10.—Spanish whiting:	
George L. Neville	20.00
White & Dodson	18.00
Chas. H. Pleasants	34.80
J. B. Kendall	18.00
Chas. M. Childs & Co	15.00
Smith, Kline & French*	13.00
Class 11.—Molasses and flour:	
Manhattan Supply Co	27.25
Chas. H. Pleasants	30.98
J. W. Paxon & Co.*	26.00
J. B. Kendall	31.75
Class 12.—Emory flour:	
Manhattan Supply Co	29.00
Chas. H. Pleasants	29.40
J. W. Paxon & Co	40.00
J. B. Kendall*	22.50

Class 12—Continued.	
Harry L. Briggs	$27.00
Smith, Kline & French	23.50
Class 13.—Core compound:	
Manhattan Supply Co	56.25
Chas. H. Pleasants	79.75
J. W. Paxon & Co.*	52.00
J. B. Kendall	55.00
Class 14.—Molding sand:	
Geo. L. Neville	3,600.00
Manhattan Supply Co	2,625.00
J. W. Paxon & Co.*	2,575.00
Class 15.—Pipe, etc.:	
Manhattan Supply Co*	299.75
Class 16.—Engine lathes:†	
† In abeyance.	
Manhattan Supply Co	36,960.00
Niles Tool Works	25,620.00
Bement Miles & Co	30,000.00
Wm. Sellers & Co	35,504.00
The Bridgeport Machine Tool Works	25,980.00

Proposals for naval supplies for the New York navy-yard, under Bureau advertisement, dated August 24, 1892; opened September 8, 1892.

Class 1.—Bolts, etc.:	
Manhattan Supply Co	$1,133.80
J. B. Morrell & Co	1,168.80
J. H. Sternbergh & Son*	1,059.50
Greenlee, Wyatt & Co	1,158.72
Eugene L. Maxwell	1,190.65
S. C. Forsaith Machine Co.	1,260.75
The Pa. Bolt and Nut Co	1,143.25
Class 2.—60 barrels cement, Portland:	
Geo. L. Neville	240.00
Manhattan Supply Co	115.80
James Brand	135.00
Smith, Kline & French Co	177.00
Alfonso de Navaro*	128.40
Robt. S. Sinclair	137.40
Hans Hemken	149.40
Class 3.—Granite:	
James Symington	2,624.00
Manhattan Supply Co	2,541.00
John Donaldson*	2,224.00
Class 4.—Broken stone:	
Geo. L. Neville	2,800.00
Manhattan Supply Co	1,281.00
John J. Donovan*	1,078.00
Class 5.—Wharf spikes:	
Geo. L. Neville	110.83
White & Dodson	107.50
Manhattan Supply Co	88.80
J. B. Morrell & Co	101.75
Greenlee, Wyatt & Co	96.95
Eugene L. Maxwell	101.61
Thompson C. G. I. & Co	118.40
The Pa. Bolt and Nut Co	92.50
Class 6.—Piles:	
Geo. L. Neville	4,120.00
W. H. Beard	2,115.00
Graves & Steers	3,657.50
Watson & Pittinger	3,692.50
James Bigler	2,708.25
Chas. L. [illegible]	3,026.65
Joseph W. Duryee	2,666.50

Class 7.—Yellow pine:	
Geo. L. Neville	$5,692.00
W. R. Adams & Co	5,610.00
Graves & Steers	6,201.00
Watson & Pittinger	5,544.00
Eppinger & Russell	5,898.00
James Bigler	5,453.00
Joseph W. Duryee*	5,280.00
Class 8.—400 barrels cement, Portland:	
Geo. L. Neville	1,600.00
Manhattan Supply Co	940.00
James Brand	900.00
Smith, Kline & French Co.	1,180.00
Alfonso de Navaro*	856.00
Robt. S. Sinclair	916.00
Hans Hemken	988.00
Class 9.—Glass:	
White & Dodson	108.00
Manhattan Supply Co	112.40
Chas. H. Pleasants	90.58
Eugene L. Maxwell	90.84
Smith, Kline & French Co.	98.42
Hemken	Informal.
Class 10.—Electrical supplies:	
Western Electric Co.*	589.75
Tissot & Schultz	708.57
International Trading and Electric Co	573.25
Class 11.—Bolts:	
White & Dodson	20.40
Manhattan Supply Co	13.80
Harry L. Briggs*	12.98
Class 12.—Hardware:	
White & Dodson	526.96
Manhattan Supply Co	470.76
Harry L. Briggs	416.67
Class 13.—Zinc:	
Geo. L. Neville	15.00
White & Dodson	18.00
Chas. H. Pleasants	11.38
Eugene L. Maxwell	14.00

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* Accepted.

† In abeyance.

Proposals for naval supplies for the New York navy-yard, etc.—Continued.

Class 13—Continued.	
J. H. Chesley & Co	$10.80
The Colwell Lead Co	12.00
Class 14.—Paints:	
White & Dodson	747.80
Manhattan Supply Co.*	658.81
Aquila Rich	685.11
Smith, Kline & French Co.	751.51
Chas. M. Childs & Co	677.73
Fiske Bros	674.63
Class 15.—Alcohol:	
Aquila Rich	51.70
Chas. N. Pleasants	67.10
Smith, Kline & French Co.	51.10
Cass 16.—White pine, etc.:	
W. R. Adams & Co	1,645.00
Watson & Pittinger	1,425.00
Chas E. Pell	1,407.00
Joseph W. Duryee*	1,266.00
Class 17.—Leather, etc.:	
White & Dodson	321.00
Manhattan Supply Co	236.60
Tissot & Schultz*	228.28
Class 18.—Pipe, etc.:	
Manhattan Supply Co	197.31
The Colwells Lead Co	160.98
Class 19.—100,000 lbs. S. W. soap:	
Manhattan Supply Co	4,119.00
Chas. J. McKeone*	3,690.00
Class 20.—Burlaps, etc.:	
Manhattan Supply Co	1,885.20
J. B. Morrell & Co	2,537,50
Harry L. Briggs	2,205,00
Joseph Wechsler	1,935.00
Tissot & Schulz*	1,751.25
Class 21.—Tin cans for coffee:	
Mary Beggs*	628.00
Manhattan Supply Co	680.00
Class 22.—White pine, etc.:	
W. R. Adams & Co	1,890.00
Watson & Pittinger	1,867.50
Chas. E. Pell	1,456.33
Joseph W. Duryee*	1,441.50
Class 23.—Padlocks:	
Geo. L. Neville	108.00
White & Dodson	106.56
Manhattan Supply Co	129.60
Eugene L. Maxwell	123.84
Harry L. Briggs	132.48
Tissot & Schultz	135.36
Class 24.—Tools:	
White & Dodson	268.50
Manhattan Supply Co	207.93
Harry L. Briggs*	191.56
Class 25.—Oil:	
White & Dodson	214.60
Manhattan Supply Co	214.40
Smith, Kline & French Co.*	136.61
Chas. M. Childs & Co	174.60
Fiske Bros	171.80
Class 26.—Cotton waste, etc.:	
White & Dodson	45.60
Manhattan Supply Co	31.68
Chas. H. Pleasants	40.22
Smith, Kline & French Co.	31.34
Chas. M. Childs & Co	36.52
Fiske Bros.*	30.88
Class 27.—Locks, etc.:	
White & Dodson	$1,284.00
Manhattan Supply Co	1,616.13
Eugene L. Maxwell	1,636.00
J. H. Chesley & Co	1,059.62
Class 28.—Stationery:	
Manhattan Supply Co.*	2.85
Chas. H. Pleasants	7.25
Class 29.—Blocks:	
Manhattan Supply Co.*	43.60
J. B. Morrell & Co	96.00
Eugene L. Maxwell	94.36
Tissot & Schultz	91.80
Class 30.—Nuts:	
Geo. L. Neville	78.30
Manhattan Supply Co	271.88
J. B. Morrell & Co	256.76
Eugene L. Maxwell*	60.99
Class 31.—Hardware:	
Manhattan Supply Co	744.60
Harry L. Briggs*	644.46
Class 32.—Drawing material:	
Manhattan Supply Co.*	461.15
Class 33.—Lamps, etc.:	
Manhattan Supply Co.*	114.50
Wm. Porter's Sons	139.50
Class 34.—Belt lacing:	
Manhattan Supply Co.*	17.04
Class 35.—Tools:	
Manhattan Supply Co	1,973.53
Harry L. Briggs	1,920.12
Class 36.—Metals:	
Manhattan Supply Co.*	1,109.67
The Colwell Lead Co	1,214.09
Class 38.—Steel:	
Manhattan Supply Co.*	35.84
Class 39.—Hose, etc.:	
Manhattan Supply Co	1,236.55
Aquila Rich	1,248,22
Eugene L. Maxwell*	1,212.40
Harry L. Briggs	1,299,34
Tissot & Schultz	1,253.87
Class 40.—Paints:	
White & Dodson	439.84
Manhattan Supply Co.*	331.35
Aquila Rich	466.28
Chas. H. Pleasants	334.19
Smith, Kline & French Co.	406.01
Chas. M. Childs & Co	333.69
Fiske Bros	354.94
Class 41.—Pipe fittings:	
The Colwell Lead Co.*	171.57
Class 42.—Stationery:	
Manhattan Supply Co.*	166.16
Class 43.—Cotton waste:	
White & Dodson	271.00
Manhattan Supply Co	234.00
J. B. Morrell & Co	292.25
Chas. H. Pleasants	314.50
Smith, Kline & French Co.	222.35
Harry L. Briggs*	215.00
Fiske Bros	222.00
Class 44.—Grommets:	
White & Dodson	118.75
Manhattan Supply Co	95.00
Aquila Rich	70.00
Harry L. Briggs*	57.00

*Accepted.

Proposals for naval supplies for the navy-yard, Mare Island, California, under Bureau advertisement dated August 22, 1892; opened September [illegible], 1892.

Class 1.—150 tons coal:	
Wm. Walker	$2,317.50
Robt. Husband	2,212.50
John L. Howard*	2,122.50
R. D. Chanler	2,152.50
Miller, Sloss & Scott	2,415.00
Class 2.—Fire brick, etc.:	
Wm. Walker	251.80
Louis E. Lake	208.50
Robt. Husband	216.45
A. S. Carman	209.00
Abraham Powell*	199.00
Miller, Sloss & Scott	201.00
Class 3.—Steel:	
S. C. Forsaith Machine Co.	331.09
Charles H. Pleasants	374.19
Dunham, Carrigan & Hayden Co.*	212.40
Miller, Sloss & Scott	218.00
J. S. Van Winkle & Co.	249.88
Class 4.—Iron:	
Albert Gallatin*	112.50
S. C. Forsaith Machine Co.	220.00
Dunham, Carrigan & Hayden Co.*	113.00
Miller, Sloss & Scott	117.00
J. S. Van Winkle & Co.	116.00
Class 5.—Metals:	
Manhattan Supply Co.	2,119.20
Pacific Metal Works	1,840.24
Dunham, Carrigan & Hayden Co.	1,805.96
W. T. Garnett & Co.	1,840.96
Miller, Sloss & Scott*	1,588.18
Class 6.—Packing:	
Manhattan Supply Co.	2,060.25
Albert Gallatin	1,947.75
Boston Woven Hose and Rubber Co	1,285.00
Harry L. Briggs	1,497.00
Arnett & Rivers	1,636.25
Dunham, Carrigan & Hayden Co	1,747.50
W. T. Garnett & Co	2,011.50
Miller, Sloss & Scott	1,846.50
James W. Gervin*	1,265.00
Wm. F. Bowers	1,763.50
A. F. Dunbar	1,790.50
Class 7.—Paints:	
Charles M. Childs & Co.	$895.80
F. N. Woods*	884.25
Charles H. Pleasants	1,020.84
R. N. Nason	938.00
Chas. M. Zates	933.30
Class 8.—Alcohol:	
F. N. Woods*	118.50
Charles H. Pleasants	157.50
Class 9.—Pipe, etc.:	
Manhattan Supply Co.	4,254.87
Albert Gallatin	3,971.68
S. C. Forsaith Machine Co.	3,735.35
Dunham, Carrigan & Hayden Co	3,519.51
W. T. Garnett & Co.*	3,201.55
Miller, Sloss & Scott	3,590.73
Class 10.—Miscellaneous:	
Hawley Bros	510.00
F. N. Woods	541.00
Louis E. Lake	421.00
Chas. H. Pleasants	412.00
Miller, Sloss & Scott*	373.00
Class 11.—Wrenches, tools, etc.:	
Manhattan Supply Co	262.05
Hawley Bros	219.45
Albert Gallatin	209.18
S. C. Forsaith Machine Co.	251.40
Dunham, Carrigan & Hayden Co	209.50
Miller, Sloss & Scott*	200.34
Class 12.—Stationery:	
Dutton & Partridge	274.70
Lee Count Bros.*	258.87
Tayot, Upham & Co	282.75
Class 13.—Lenses:	
Manhattan Supply Co.	415.20
F. N. Woods	378.00
Chas. H. Pleasants	399.48
Miller, Sloss & Scott	492.00
Benjamin H. Shoemaker*	345.60
Class 14:	
Manhattan Supply Co	1,241.60
Louis E. Lake*	1,010.85
Miller, Sloss & Scott	1,036.90

Proposals for stationery for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 1:	
Manhattan Supply Co.*	$183.87
Samuel Ward Co	206.90
Class 2:	
Manhattan Supply Co.*	331.97
Samuel Ward Co	447.80
Class 3:	
Manhattan Supply Co	$723.09
Samuel Ward Co.*	702.69
Class 4:	
Manhattan Supply Co.*	122.80

Proposals for stationery for the navy-yard, Boston, Mass., under Bureau advertisement dated August 20, 1892; opened September 12, 1892.

Class 5:	
Manhattan Supply Co	$146.17
Samuel Ward Co	138.60
Winkley, Dresser & Co.*	129.69
Class 6:	
Manhattan Supply Co	$303.44
Samuel Ward Co	325.73
Winkley, Dresser & Co.*	249.17

* Accepted.

Proposals for stationery for the navy-yard, Boston, Mass., etc.—Continued.

Class 7:	
Manhattan Supply Co.*	$533.70
Samuel Ward Co	648.80
Winkley, Dresser & Co	569.81
Class 8:	
Manhattan Supply Co	$197.60
Winkley, Dresser & Co	189.94

Proposals for stationery for the torpedo station, Newport, R. I., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 9:	
Manhattan Supply Co. *	$61.67
Class 10:	
Manhattan Supply Co. *	110.00
Samuel Ward Co	130.10
Class 11:	
Manhattan Supply Co. *	$171.23
Samuel Ward Co	177.35

Proposals for stationery for the naval training station, Newport, R. I., under Bureau advertisement dated August 20, 1892; opened September, 13, 1892.

Class 12:	
Manhattan Supply Co. *	$35.20
Samuel Ward Co	38.32
Class 13:	
Manhattan Supply Co. *	$164.62
Samuel Ward Co	195.20
Class 14:	
Manhattan Supply Co. *	351.76

Proposals for stationery for the naval station, New London, Conn., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 15:	
Manhattan Supply Co. *	$40.61
Class 16:	
Manhattan Supply Co. *	65.58
Samuel Ward Co	73.95
Class 17:	
Manhattan Supply Co. *	$96.31
Samuel Ward Co	102.25

Proposals for stationery for the navy-yard, New York, under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 18:	
Manhattan Supply Co. *	$1,077.88
Class 19:	
Manhattan Supply Co	3,235.25
Class 20:	
Manhattan Supply Co. *	$5,363.27
John M. Bulwinkle	6,189.85
Bownes Co	6,326.31

Proposals for stationery for the navy-yard, League Island, Pennsylvania, under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 22:	
Manhattan Supply Co	$151.50
Wm. H. Hoskins *	102.55
Class 23:	
Manhattan Supply Co. *	278.82
Wm. H. Hoskins	290.73
Class 24:	
Manhattan Supply Co.*	$500.79
Wm. H. Hoskins	522.08
Class 25:	
Manhattan Supply Co. *	178.21

Proposals for stationery for the Naval Academy, Annapolis, Md., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 26:	
Manhattan Supply Co	$187.11
Hume & Bilisoly *	78.68
Geo. W. Jones	110.10
Class 27:	
Manhattan Supply Co	557.73
Hume & Bilisoly *	385.78
Geo. W. Jones	523.94
Class 28:	
Manhattan Supply Co	$1,496.56
Hume & Bilisoly *	1,150.81
Geo. W. Jones	1,489.33
Class 29:	
Manhattan Supply Co	138.95
Hume & Bilisoly *	137.61
Geo. W. Jones	171.88

* Accepted.

Proposals for stationery for the navy-yard, Washington, D. C., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 30:	
Manhattan Supply Co	$491.90
Hume & Bilisoly *	368.83
Wm. Ballantyne & Sons	311.60
Class 31:	
Manhattan Supply Co	1,947.83
Hume & Bilisoly *	1,525.21
Class 32:	
Manhattan Supply Co	$2,070.50
Hume & Bilisoly *	1,733.46
Wm. Ballantyne & Sons	1,839.09
Class 33:	
Manhattan Supply Co.	238.40
Hume & Bilisoly	245.25
Wm. Ballantyne & Sons *	237.92

Proposals for stationery for the navy-yard, Norfolk, Va., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 34:	
Manhattan Supply Co	$214.45
W. L. Crump & Co	222.27
Hume & Bilisoly *	150.21
Class 35:	
Manhattan Supply Co	601.54
W. L. Crump & Co	571.45
Hume & Bilisoly *	531.25
Class 36:	
Manhattan Supply Co	$1,110.75
Hume & Bilisoly *	1,036.77
Class 37:	
Manhattan Supply Co	392.42
Hume & Bilisoly *	288.18

Proposals for stationery for the naval station, Key West, Fla., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 38:	
Manhattan Supply Co.*	$18.25
Class 39:	
Manhattan Supply Co.*	24.65
Class 40:	
Manhattan Supply Co.*	$96.01

Proposals for stationery for the navy-yard, Pensacola, Fla., under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 41:	
Manhattan Supply Co	$28.50
T. J. McKenzie Oerting *	27.30
Class 42:	
Manhattan Supply Co.*	49.91
T. J. McKenzie Oerting	58.35
Class 43:	
Manhattan Supply Co.*	$90.40
T. J. McKenzie Oerting	99.50

Proposals for stationery for the navy-yard, Mare Island, California, under Bureau advertisement dated August 20, 1892; opened September 13, 1892.

Class 44:	
Manhattan Supply Co.*	$663.18
Payot, Upham & Co	758.95
H. S. Crocker & Co	812.25
Le Count Bros	769.55
Dutton & Partridge	788.58½
Cunningham, Curtiss & Welch	759.15
Class 45:	
Manhattan Supply Co.*	972.97
Payot, Upham & Co	1,254.69
H. S. Crocker & Co	1,271.10
Le Count Bros	1,209.66
Dutton & Partridge	1,190.60
Cunningham, Curtiss & Welch	1,212.36
Class 46:	
Manhattan Supply Co.*	$2,290.51
Payot, Upham & Co	2,557.43
H. S. Crocker & Co	2,443.40
Le Count Bros	2,680.51
Cunningham, Curtiss & Welch	2,699.31
Class 47:	
Manhattan Supply Co	667.66
Payot, Upham & Co	602.99
H. S. Crocker & Co	601.05
Le Count Bros	679.40
Cunningham, Curtiss & Welch*	599.19

*Accepted.

Proposals for ordnance supplies for the navy-yard, Washington, D. C., under Bureau advertisement, dated August 30, 1892; opened September 20, 1892.

Class 1.—3,000 gals. lard oil:*	
Geo. L. Neville	$1,860.00
Fiske Bros	1,470.00
Geo. Ryneal, jr	1,740.00
Chas. Becker	1,740.00
Chas. M. Childs & Co	2,100.00
Manhattan Oil Co	1,350.00
Class 2.—800 gallons heavy petroleum:	
Borne, Scrymser & Co	272.00
Geo. L. Neville	108.00
Fiske Bros. bid A	240.00
bid B	104.00
Geo. Ryneal, jr	104.00
Chas. Becker	112.00
The Standard Oil Co.†	78.00
Manhattan Oil Co	320.00
Class 3.—200 gallons lard oil:	
Geo. L Neville	128.00
Fiske Bros	130.00
Geo. Ryneal, jr.†	124.00
Chas. Becker	126.00
Chas. M. Childs & Co	140.00
Manhattan Oil Co	130.00
Class 4.—1,500 gallons paraffin oil:	
Borne, Scrymser & Co	187.50
Geo. L. Neville	195.00
Fiske Bros	165.00
George Ryneal jr	172.50
Charles Becker	163.50
Thompson C. Gill & Co	375.00
The Standard Oil Co.†	127.00
Manhattan Oil Co	180.00
Class 5.—100 gallons rape seed oil:	
Borne, Scrymser & Co	78.00
Geo. L. Neville	85.00
Fiske Bros	65.00
Geo. Ryneal, jr	78.00
Chas. Becker	79.00
Chas. M. Childs & Co	65.00
Manhattan Oil Co.†	63.00
Class 6.—Tools:	
Harry L. Briggs†	513.15
Manhattan Supply Co	606.35
S. C. Forsaith Machine Co.‡	
McFadden Co	583.57
A. P. Swoyer & Co	551.78
Class 7.—Poplar timber:	
Geo. L. Neville	4,937.50
Edwin A. Gaskill †	3,400.00
John C. Emerson	5,000.00
Class 8.—Steel beams:	
Manhattan Supply Co	1,965.21
S. C. Forsaith Machine Co.	1,835.64
Thompson C. Gill & Co	1,792.45
J. B. Kendall †	1,727.66
A. P. Swoyer & Co	1,871.63
Class 9.—Yellow pine:	
Geo. L. Neville	1,196.25
Joseph W. Duryee	1,196.25
Edwin A. Gaskill†	941.41
John C. Emerson	1,243.37
Class 10.—Screws, etc.:	
Harry L. Briggs	$347.35
S. C. Forsaith Machine Co.†	307.60
J. H. Sternbergh	312.00
McFadden Co	312.85
Class 11.—Forgings:	
Midvale Steel Co.†	755.70
The Bethlehem Iron Co	944.63
Class 12.—75,000 yards:	
Geo. L. Neville	1,867.50
Manhattan Supply Co.†	1,792.50
Tissot & Schultz	2,062.50
Hans Hemken	1,672.50
Class 13.—Silk	
Geo. L. Melville	1,250.00
Manhattan Supply Co.†	240.00
Tissot & Schultz	250.00
Hans Hemken	362.00
Class 14.—Castings:	
Standard Steel Casting Co. †	15,521.75
Midvale Steel Co	17,833.50
Norristown Steel Co	17,998.62
Class 15.—Spikes	
Manhattan Supply Co	78.00
Thompson C. Gill & Co.§	37.96
J. B. Kendall †	51.20
Class 16.—Pine:	
Geo. L. Neville	252.00
Edwin A Gaskill †	189.00
Class 17.—Steel rail:	
Manhattan Supply Co	669.80
Thompson C. Gill & Co.†	630.70
J. B. Kendall	654.50
Class 18.—Iron pipe, etc.:	
J H Chesley & Co	116.87
Manhattan Supply Co.†	82.24
Colwell Lead Co	106.48
S. C Forsaith Machine Co.	107.22
Thompson C. Gill & Co	146.52
A. P. Swoyer & Co	108.76
Ford & Kendig Co	90.30
Class 19.—Grate, etc.:	
J. H. Chesley & Co.*	3.19
Class 20.—Virginia yellow pine:	
Geo. L. Neville	1,244.96
Edwin A Gaskill†	555.33
John C. Emerson	1,157.29
Class 21.—Hardware	
J H Chesley & Co.†	177.02
Class 22.—Paints, etc.:	
Chas. H Pleasants	405.85
Shoemaker & Busch	395.98
Geo. L. Neville	425.60
Aquila Rich	392.16
Geo. Ryneal, jr	397.73
Chas. Becker	391.45
Chas. M. Childs & Co	384.47
Daniel Shannahan	362.70
Harrison Bros. & Co	376.04
Smith Kline & French Co.	380.26
Class 23.—White pine, etc.:	
George L. Neville	423.30
Joseph W. Duryee	303.31
Edwin A. Gaskill	284.42
John C. Emerson	406.15

* No award. † Accepted. ‡ Withdrawn. § Informal.

Proposals for ordnance supplies for the navy-yard, Washington, D. C., etc.—Continued.

Class 24.—Cement, etc.:	
George L. Neville*†	$301.50
Daniel Shannahan	301.50
Class 25.—Lumber, ash, etc.:	
George L. Neville	480.00
Edwin A. Gaskill*	300.00
John C. Emerson	456.00
Class 26.—Window glass:	
Charles H. Pleasante	73.60
Shoemaker & Busch	74.80
George L. Neville	78.00
George Ryneal, jr.*	49.80
Class 26—Continued.	
Hans Hemken	$99.40
Charles Becker	84.00
A. P. Swoyer & Co	89.80
Class 27.—Steel rail:	
Thompson C. Gill & Co	459.50
J. B. Kendall*	445.70
Class 28.—Piles:	
George L. Neville	624.00
J. B. Kendall*	260.00
Edwin A. Gaskell	431.60
John C. Emerson	676.00

Proposals for naval supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated September 1, 1892; opened September 20, 1892.

Class 1.—150 tons bituminous coal:	
Geo. L. Neville	$1,750.00
E. C. Brooks	1,800.00
Pocahontas Coal Co. bid A	1,525.00
bid B	1,675.00
Class 2.—Molding pine:	
George L. Neville	1,159.00
Edwin A. Gaskill*	272.87
John C. Emerson	1,159.00
Class 3.—Machine screws:	
Geo. L. Neville	76.95
Tissot & Schultz	85.05
Harry L. Briggs	75.15
J. H. Chesley & Co	98.10
A. P. Swoyer & Co	83.70
McFadden Co.	64.35
White & Dodson	82.35
Class 4—Tools:	
Geo. L. Neville	267.30
The Manhattan Supply Co.	190.51
Harry L. Briggs	161.61
J. H. Chesley & Co	226.80
A. P. Swoyer & Co	191.99
White & Dodson	233.50
Class 5.—Hardware:	
Geo. L. Neville	35.50
The Manhattan Supply Co.	42.10
White & Dodson*	26.90
Class 6.—Paint brushes, etc.:	
Geo. L. Neville	117.50
Harry L. Briggs*	66.34
J. H. Chesley & Co	67.14
White & Dodson	88.32
Class 7.—White pine:	
Geo. L. Neville	102.00
Edwin A. Gaskill*	69.30
John C. Emerson	101.90
Class 8.—Sperm oil:	
Geo. L. Neville	30.00
Fiske Brothers*†	30.00
White & Dodson	34.50
Class 9.—Paints:	
Aquila Rich	119.25
Geo. L. Neville	121.50
Hanline Brothers	124.00
Chas. M. Childs & Co.*	108.92
Smith, Kline & French Co.	119.89
White & Dodson	117.50
Class 10.—Cement:	
Geo. L. Neville	$87.50
S. W. Niemeyer	95.00
E. C. Brooks*	74.50
Smith, Kline & French Co.	93.50
O. L. Williams	87.50
Class 11.—Railroad ties:	
Geo. L. Neville	100.00
Chas. S. Conner*	25.00
E. C. Brooks	37.50
Class 12.—Oyster shells:	
Geo. L. Neville	1,485.00
Giles Cuffee	825.00
S. W. Niemeyer	1,500.00
E. C. Brooks	750.00
Sam'l P. Oast	675.00
Nottingham & Wrenn	900.00
John T. Bolton*	506.25
Class 13.—Bolts and nuts:	
Thompson C. Gill & Co	210.12
Geo. L. Neville*	105.65
The Manhattan Supply Co.	213.93
Tissot & Schultz	254.51
A. P. Swoyer & Co	162.57
J. H. Sternberg	185.40
Class 14.—Brushes, etc.:	
Geo. L. Neville	259.75
The Manhattan Supply Co	235.83
Tissot & Schultz	297.68
J. Friedenstein*	179.65
J. H. Chesley & Co	232.03
A. P. Swoyer & Co	334.21
White & Dodson	235.35
Class 15. Moulding sand:	
Thompson C. Gill & Co	521.00
Geo. L. Neville	361.00
S. W. Niemeyer	401.00
J. W. Paxon & Co	110.00
E. C. Brooks*	241.00
Class 16.—Roving cotton:	
Geo. L. Neville*	254.70
The Manhattan Supply Co.	342.00
White & Dodson	285.00
Class 17.—Steel wire:	
Geo. L. Neville	91.71
The Manhattan Supply Co.	88.07
Harry L. Briggs*	65.92
J. H. Chesley & Co	71.60
A. P. Swoyer & Co	108.10
White & Dodson	73.18

* Accepted.

† Decided by lot.

Proposals for naval supplies for the navy-yard, Norfolk, Va., etc.—Continued.

Class 18.—Lamp wicks, etc.:	
Geo. L. Neville	$25.50
Tissot & Schultz	42.75
White & Dodson*	24.75
Class 19.—Leather:	
Geo. L. Neville	20.25
The Manhattan Supply Co.	24.75
Tissot & Schultz	22.50
White & Dodson*	15.30
Class 20.—Spruce:	
Geo. L. Neville	310.00
Chas. S. Conner	309.60
Edwin A. Gaskill*	300.00
Class 21.—Tools:	
Geo. L. Neville	172.82
The Manhattan Supply Co.	172.98
Harry L. Briggs	179.71
Eugene L. Maxwell	186.62
S. C. Forsaith Machine Co.	197.69
J. H. Chesley & Co.*	140.62
A. P. Swoyer & Co	239.24
McFadden Co	170.46
White & Dodson	184.68
Class 22.—Metals:	
Colwell Lead Co	1,382.38
Geo. L. Neville*	1,253.33
Manhattan Supply Co	1,441.80
J. H. Chesley & Co	1,390.96
A. P. Swoyer & Co	1,384.85
White & Dodson	1,624.20
Class 23.—Rubber, etc.:	
Aquila Rich	42.00
Geo. L. Neville	42.50
Manhattan Supply Co.*	41.50
Harry L. Briggs	55.00
White & Dodson	64.00
Class 24.—Paints:	
Aquila Rich	$2,196.71
Geo. L. Neville	2,368.00
Chas. M. Childs & Co	2,144.95
Smith, Kline & French Co.*	2,118.03
White & Dodson	2,158.60
Class 25.—Alcohol:	
Aquila Rich	128.15
Smith, Kline & French Co.*	124.85
Class 26.—Pitch pine:	
Geo. L. Neville*	95.50
S. W. Niemeyer	98.75
Class 27.—Oil:	
Geo. L. Neville	332.50
Fiske Bros*	294.50
Borne, Scrymser & Co	354.00
White & Dodson	342.50
Class 28.—Pipe fittings:	
Colwell Lead Co	282.50
E. T. Tweedy	248.09
Geo. L. Neville	267.99
S. C. Forsaith Machine Co.	300.16
J. H. Chesley & Co	273.44
A. P. Swoyer & Co.*	223.24
Class 29.—Cotton waste:	
Geo. L. Neville*	119.00
Manhattan Supply Co	126.00
White & Dodson	131.00
Class 30.—Copper:	
Geo. L. Neville	1,158.00
Manhattan Supply Co	1,220.00
J. Friedenstein*	1,149.00
J. H. Chesley & Co	1,238.00
White & Dodson	1,325.00

Proposals for naval supplies for the navy-yard, Boston, Mass., under Bureau advertisement dated September 2, 1892; opened September 20, 1892.

Class 1.—Boat-timber and keel-bending machine:	
Ansel W. Paine	$2,750.00
Augustus Stevenson*	2,500.00
Class 2.—Handirons, etc.:	
Ansel W. Paine	1,418.75
Manhattan Supply Co	1,219.95
Tissot & Shultz	1,324.45
Harry L. Briggs*	1,162.86
Class 3.—Brushes, etc.:	
Ansel W. Paine	246.80
Manhattan Supply Co	147.90
Tissot & Shultz	139.07
Harry L. Briggs*	124.10
Taylor P. Thompson	152.01
Class 4.—Lime, etc.:	
Ansel W. Paine*	25.50
Manhattan Supply Co	30.60
Taylor P. Thompson	27.00
Class 5.—Hardware:	
Ansel W. Paine	92.25
Manhattan Supply Co	91.19
Class 5—Continued:	
Tissot & Shultz	$85.88
Harry L. Briggs*	73.17
Class 6.—Kitchen utensils:	
Ansel W. Paine	265.00
Manhattan Supply Co.*	186.75
Tissot & Shultz	190.53
Class 7.—Coal baskets:	
Ansel W. Paine	260.10
Manhattan Supply Co.*	234,56
Class 8.—Pump:	
Manhattan Supply Co.*	60.00
Class 9.—Hose:	
Manhattan Supply Co	748.50
Aquila Rich*	620.00
Harry L. Briggs	623.00
Gutta-Percha and Rubber Manufacturing Co	867.05
Boston Woven Hose and Rubber Co	674.25
Revere Rubber Co	796.50
A. P. Swoyer & Co	794.00

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*Accepted.

Proposals for naval supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement August 31, 1892; opened September 20, 1892.

Class 1.—Boiler tubes:*	
S. C. Forsaith Machine Co.	$1,992.00
William A. Wheeler	2,584.00
Class 2.—Boiler tubes:*	
S. C. Forsaith Machine Co.†	3,744.00
William A. Wheeler	3,328.00
Class 5.—Keel plate bending machine:	
S. C. Forsaith Machine Co.	12,240.00
Morgan Engineering Co.	15,090.00
Wm. H. Wood	21,135.00
Class 6.—Hardware:	
Harry L. Briggs†	203.32
Class 8.—Pine, etc.:	
Joseph W. Duryee†	156.00
S. C. Forsaith Machine Co.	215.00
Class 9.—Paints:	
Chas. H. Pleasants	73.65
Aquila Rich	52.90
Gould & Cutler	58.20
Chas. M. Childs & Co.†	52.50
Class 10.—Pipe, etc.:	
Geo. L. Neville	309.00
Eugene L. Maxwell	Informal.
Manhattan Supply Co.	339.36
Colwell Lead Co.†	272.52
A. P. Swoyer & Co	286.93
S. C. Forsaith Machine Co.	279.49
Wm. A. Wheeler	295.07
Class 11.—Tools:	
Harry L. Briggs†	176.56
Eugene L. Maxwell	200.28
S. C. Forsaith Machine Co.	218.36
Class 12.—Waste, etc.:	
Manhattan Supply Co.†	56.00
Chas. M. Childs & Co.	67.50
Class 13.—Lumber:	
Joseph W. Duryee†	487.50
S. C. Forsaith Machine Co.†	473.50
Class 14.—Lumber:	
Joseph W. Duryee†	$687.50
Class 15.—Oars:	
Chas. H. Pleasants†	156.46
James W. Soper	165.50
Geo. L. Neville	196.74
Aquila Rich	179.51
Manhattan Supply Co.	179.55
Tissot & Schultz	181.00
Wm. A. Wheeler	181.00
Class 16.—Metals:	
Thompson C. Gill & Co.	398.00
Chas. H. Pleasants	353.53
Geo. L. Neville	362.00
Manhattan Supply Co.	357.20
Colwell Lead Co.†	345.10
A. P. Swoyer & Co.	361.50
S. C. Forsaith Machine Co.	356.50
Wm. A. Wheeler	384.50
Class 17.—Iron:	
Thompson C. Gill & Co.	85.84
Manhattan Supply Co.	106.80
A. P. Swoyer & Co.†	84.19
Wm. A. Wheeler	99.75
Class 18.—Belting:	
Geo. L. Neville†	653.40
Eugene L. Maxwell	1,039.40
Manhattan Supply Co.	655.00
A. P. Swoyer & Co.	990.90
S. C. Forsaith Machine Co.	711.85
Wm. A. Wheeler	910.90
Page Belting Co.	727.00
Class 19.—Packing, etc.:	
Harry L. Briggs	53.80
Eugene L. Maxwell†	15.20
Aquila Rich	49.24
Manhattan Supply Co.	22.70
Tissot & Schultz	29.24
Class 20.—Oil, etc.:	
Chas. M. Childs & Co.	101.25
Fiske Bros	85.25

Proposals for naval supplies for the Naval Academy, Annapolis, Md., under Bureau advertisement dated September 2, 1892; opened September 20, 1892.

Class 2:	
R. R. Magruder & Co.	$730.22
J. H. Chesley & Co.	676.41
Harry L. Briggs†	635.16
White & Dodson	1,017.58
Class 3.—Lime, etc.:	
Dan'l I. Saunders	210.25
S. W. Niemeyer	255.40
A. P. Swoyer & Co.†	201.84
Shoemaker & Busch	207.70
Chas. H. Pleasants	275.33
Class 4.—Kitchen utensils:	
John E. A. Cunningham†	56.20
R. R. Magruder & Co	75.08
J. H. Chesley & Co.	68.10
White & Dodson	116.90
Class 5.—Glass:	
A. P. Swoyer & Co.	114.13
Shoemaker & Busch	123.20
Chas. H. Pleasants	185.60
Class 5.—Continued.	
Wm. Kings Bro.†	$108.70
R. R. Magruder & Co	123.35
White & Dodson	145.75
Class 6.—Lumber, W. P.:	
Joseph W. Duryee†	776.85
Wm. D. Gill & Son	856.25
Edwin A. Gaskill	803.40
Class 7.—Yellow pine:	
Joseph W. Duryee	775.00
Wm. D. Gill & Son†	692.00
Edwin A. Gaskill	711.00
Class 8.—Poplar:	
Joseph W. Duryee	323.50
Wm. D. Gill & Son	310.00
Edwin A. Gaskill†	290.05
Class 9.—Pipe, etc.:	
Colwell Lead Co	1,018.64
Manhattan Supply Co	1,067.44
Ford & Kendig Co	825.02

* No award bids excessive.

† Accepted.

Proposals for naval supplies for the Naval Academy, Annapolis, Md., etc.—Continued.

Class 9.—Continued.	
S. C. Forsaith Machine Co.	$877.58
A. P. Swoyer & Co.*	817.05
J. H. Chesley & Co	960.20
E. T. Tweedy	897.90
Class 10.—Stove fixtures:	
John E. A. Cunningham*	136.91
R. R. Magruder & Co	159.48
J. H. Chesley & Co	184.01
Class 11.—Metals:	
Thompson C. Gill & Co.*	226.23
R. R. Magruder & Co	331.73
White & Dodson	407.00
Class 12.—Paints:	
Hanline Bros	720.75
Shoemaker & Busch*	654.40
R. R. Magruder & Co	868.80
G. & N. Popplein, jr	751.68
Chas. M. Childs & Co	660.06
John Lucas & Co	738.01
White & Dodson	735.30
Aquila Rich	695.30
Class 13.—Tools:	
Anderson & Ireland	94.08
A. P. Swoyer & Co	107.08
R. R. Magruder & Co	106.02
J. H. Chesley & Co	97.40
Harry L. Briggs*	86.45
White & Dodson	98.06
Class 14.—Electric supplies:	
Tissot & Schultz	32.10
R. R. Magruder & Co.*	29.80
White & Dodson	41.50
Class 15.—Hose, etc.:	
Manhattan Supply Co	203.70
Class 15.—Continued.	
Tissot & Schultz	$217.95
Page Belting Co.*	118.55
R. R. Magruder & Co	190.70
E. T. Tweedy	135.90
Harry L. Briggs	137.90
White & Dodson	219.50
Aquila Rich	134.88
Class 16.—Alcohol:	
Shoemaker & Busch*	119.63
Chas. H. Pleasants	164.45
R. R. Magruder & Co	137.50
Aquila Rich	128.15
Class 17.—Lard oil:	
Fisk Bros	132.00
Shoemaker & Busch*	128.32
Chas. H. Pleasants	144.00
R. R. Magruder & Co	130.00
Chas. M. Childs & Co	132.00
White & Dodson	134.00
Class 18.—Waste:	
Manhattan Supply Co	71.40
Shoemaker & Busch*	52.65
Chas. H. Pleasants	63.07
R. R. Magruder & Co	57.25
Chas. M. Childs & Co	97.00
White & Dodson	82.50
Class 19.—Ladders:	
R. R. Magruder & Co	20.50
White & Dodson*	15.25
Class 20.—Carpet lining:	
Manhattan Supply Co	47.00
Tissot & Schultz	80.00
R. R. Magruder & Co	60.00
J. H. Chesley & Co.*	27.50

Proposals for copper, etc., for the navy-yard, Mare Island, California, under Bureau advertisement dated August 27, 1892; opened September 20, 1892.

Class 1.—Ingot copper:	
Selby Smelting and Lead Co.*	$926.25
Miller, Sloss & Scott	933.75
Dunham, Carrigan & Hayden Co	975.00
Class 2.—Sugar:	
Herman J. Saddler	$372.00
Wm. Haas	367.50
Sam'l. J. Wormser*	359.40

Proposals for naval supplies for the navy-yard, New York, under Bureau advertisement dated August 29, 1892; opened September 20, 1892.

Class 1.—Ladders:	
Manhattan Supply Co.*	$170.00
W. L. Gledden	195.00
Class 2.—White pine:	
Watson & Pittinger	370.00
Chas. E. Pell	373.40
Smith, Kline & French Co*	320.00
Class 3.—Brushes:	
Harry L. Briggs*	210.79
Manhattan Supply Co	259.72
Tissot & Schultz	253.74
Class 4.—Muslin, etc.:	
Manhattan Supply Co.*	36.80
Tissot & Schultz	52.00
Class 5.—Tools:	
Harry L. Briggs*	287.82
Manhattan Supply Co	304.37
Tissot & Schultz	394.08
Class 6.—Metals:	
Manhattan Supply Co.*	29.40
Frank H. Woodruff & Co.	31.65
Class 7.—Hose:	
Harry L. Briggs	67.50
Aquila Rich*	31.86
Manhattan Supply Co	39.60
Class 8.—Alcohol:	
Aquila Rich*	23.60
Shoemaker & Busch	23.70

*Accepted.

Proposals for naval supplies for the navy-yard, New York, etc.—Continued.

Class 8.—Continued.	
Chas. H. Pleasants	$34.90
Smith, Kline & French Co.	24.90
Class 9.—Oil:	
Fiske Bros	282.70
Shoemaker & Busch	304.70
Chas. W. Childs & Co	290.90
Smith, Kline & French Co.	309.70
Class 10.—Paints:	
Aquila Rich	144.43
Shoemaker & Busch	137.90
Chas. H. Pleasants	163.79
Chas. M. Childs & Co	134.30
Smith, Kline & French Co.*	128.45
Class 11.—Glycerine, etc.:	
Harry L. Briggs	589.45
Aquila Rich	501.10
Manhattan Supply Co	558.70
Tissot & Schultz	514.60
Fiske Bros.*	484.70
Chas. H. Pleasants	591.28
Class 11.—Continued.	
Chas. M. Childs & Co.	$519.98
Smith, Kline & French Co.	495.28
Class 12.—Stationery, etc.:	
Manhattan Supply Co.	64.21
Tissot & Schultz*	47.24
Class 13.—Candles:	
Manhattan Supply Co. *	89.00
Fiske Bros	133.50
Chas. H. Pleasants	147.46
Class 14.—Tube expanders:	
Manhattan Supply Co.	693.00
Tissot & Schultz	720.00
Eugene L. Maxwell*	600.00
Class 15.—Boiler tubes: †	
Frank H. Woodruff & Co.	1,690.00
S. C. Forsaith Machine Co.	1,992.00
Class 16.—Boiler tubes: †	
Frank H. Woodruff & Co.	2,592.00
S. C. Forsaith Machine Co.	3,744.00

Proposals for provisions, etc., for the New York navy-yard under Bureau advertisement dated September 6, 1892; opened September 27, 1892.

Class 1.—10,000 pounds salt pork in barrels, 10,000 pounds in half barrels:	
Figge & Bro	$1,807.00
Chas. F. Mattlage *	1,620.00
Class 2.—15,000 pounds salt beef in barrels, 15,000 pounds in half barrels:	
Francis H. Leggett & Co.	1,456.50
Chas. F. Mattlage *	1,419.00
Chas. E. Ahrens	1,740.00
Class 3.—2,000 pounds rice:	
Francis H. Leggett & Co.	125.00
John J. O'Rourke	115.80
Thurber, Whyland & Co.	126.20
Chas. E. Ahrens *	108.00
Class 4.—2,000 pounds evaporated apples:	
John J. O'Rourke *	214.60
Chas. E. Ahrens	260.00
Class 5.—10,000 pounds tomatoes:	
Francis H. Leggett & Co.	393.00
John J. O'Rourke	397.00
Thurber, Whyland & Co.	410.00
Kemp, Day & Co.*	355.00
Charles E. Ahrens	360.00
Class 6.—35,000 pounds pickles:	
F. Foehrenbach & Co.*	2,380.00
Kemp, Day & Co	3,202.50
Chas. E. Ahrens	2,450.00
Class 7.—5.000 gallons sirup:	
Francis H. Leggett & Co.*	1,175.00
John J. O'Rourke	1,448.50
Harry L. Briggs	1,475.00
Thurber, Whyland & Co.	1,275.00
Chas. E. Ahrens	1,350.00
Class 8.—2,000 gallons vinegar:	
F. Foehrenbach & Co.	287.50
John J. O'Rourke	242.60
Chas. E. Ahrens	250.00
Class 9.—35,000 pounds tinned vegetables:	
Francis H. Leggett & Co	$2,254.00
John J. O'Rourke	2,257.50
Thurber, Whyland & Co.	2,383.50
Kemp, Day & Co.*	2,093.00
Chas. E. Ahrens	2,240.00
Class 10.—Rivets and nuts:	
J. H. Sternbergh & Son*	205.80
Class 11.—Drawing instruments:	
Manhattan Supply Co.*	86.70
Class 12.—Lamps:	
Manhattan Supply Co. *	106.80
Wm. Porter's Sons	120.00
Class 13.—Oil filter:	
Keystone Oil Purifier Manufacturing Co.*	255.00
Class 14.—Gauges, pipe fittings:	
S. C. Forsaith Machine Co.	1,158.48
Manhattan Supply Co. ‡	552.44
Morse Burtis*	760.40
Class 15.—Stationery:	
Manhattan Supply Co. *	27.30
Class 16.—Tools:	
Harry L. Briggs	61.88
Manhattan Supply Co	77.00
Morse Burtis*	50.30
Class 17.—Wire gauze:	
Harry L. Briggs. *	167.00
Manhattan Supply Co	170.00
Thompson C. Gill & Co	Informal.
Class 18.—Tobins bronze:	
Harry L. Briggs	182.00
Manhattan Supply Co	184.00
Morse Burtis	180.00
Ansonia Brass and Copper Co.*	170.00
Class 19.—Packing:	
Manhattan Supply Co. *	754.00

*Accepted. †No award; old excessive. ‡Withdrawn.

Proposals for provisions, etc., for the New York navy-yard, etc.—Continued.

Class 20.—Pipe fittings:	
S. C. Forsaith Machine Co.	$78.78
Manhattan Supply Co	71.50
Morse Burtis*	45.90
Class 21.—Copper:	
S. C. Forsaith Machine Co.	605.72
Manhattan Supply Co	568.32
Ansonia Brass and Copper Co*	514.00
Thompson C. Gill & Co	653.95
Class 22.—Brass tubing:	
S. C. Forsaith Machine Co.	$501.22
Manhattan Supply Co	507.14
Morse Burtis *	461.21
Class 23.—Calfskin shoes:	
Tissot & Schultz	8,000.00
George F. Roedel*	6,975.00
Munroes, Packard & Linscott	7;743.75
J. Freeman's Shoe Manufacturing Co	7,850.00

Proposals for provisions, etc., for the navy-yard, Mare Island, Cal., under Bureau advertisement dated September 5, 1892; opened September 27, 1892.

Class 1.—15,000 pounds flour:	
Starr & Co.*	$375.00
T. J. Parsons	393.75
Thos. H. Dowling	382.50
William Haas	431.25
Class 2.—10,000 pounds pork:†	
Henry Mahr	1,000.00
Roth, Blum & Co	1,145.00
Class 3.—1,500 gallons beans:	
Jacob Levi, jr	350.62
Sam'l J. Wormser*	334.80
Thos. H. Dowling	367.50
Wm. Haas	390.00
Class 4.—10,000 pounds salt beef:†	
Henry Mahr	800.00
Roth, Blum & Co	745.00
Class 5.—2,000 lbs. dried fruit:	
Jacob Levi, jr	263.00
Sam'l J. Wormser	254.00
Thos. H. Dowling	250.00
Wm. Haas*	240.00
Class 6.—5,000 pounds corned beef:	
Jacob Levi, jr	$450.00
Sam'l J. Wormser	520.00
Thos. H. Dowling*	418.75
Wm. Haas	450.00
Class 7.—25,000 pounds sugar:	
Jacob Levi, jr	1,506.25
Sam'l J. Wormser*	1,500.00
Wm. Haas	1,531.25
Class 8.—500 gallons vinegar:	
Jacob Levi, jr	75.00
Sam'l J. Wormser	82.50
Thos. H. Dowling*	58.75
Wm. Haas	100.00
Class 9.—Roller bushings:	
Lewis Anderson & Co	657.36
S. C. Forsaith Machine Co.	613.98
Manhattan Supply Co.*	549.00
Chas. J. Hendrys Sons & Co	924.00
Wright, Brown & Co	756.28

Proposals for castings and forgings for the navy-yard, Washington, D. C., under Bureau advertisement, dated September 15, 1892; opened October 1, 1892.

Class 1.—Castings:	
The Benjamin, Atha & Illingworth Co.*	$9,630.00
Solid Steel Co	12,037.50
Penn Steel Casting and Machine Co	10,432.50
Standard Steel Casting Co.	12,037.50
Eureka Cast Steel Co	11,235.00
Norristown Steel Co	10,432.50
Midvale Steel Co	11,770.00
Class 2.—Castings:	
The Benjamin, Atha & Illingworth Co.*	6,030.00
Solid Steel Co	7,537.50
Penn Steel Casting and Machine Co	6,532.50
Standard Steel Casting Co.	7,537.50
Eureka Cast Steel Co	7,035.00
Class 2.—Castings—Continued:	
Norristown Steel Co	$6,532.50
Midvale Steel Co	7,370.00
Class 3.—Forgings:	
Bethlehem Iron Co	400.00
Midvale Steel Co.*	260.60
Class 4.—Forgings:	
The Benjamin, Atha & Illingworth Co.*	164.10
Midvale Steel Co	381.65
Class 5.—Forgings:	
The Benjamin, Atha & Illingworth Co.*	293.25
Bethlehem Iron Co	586.56
Midvale Steel Co	645.15
Class 6.—Forgings:	
Bethlehem Iron Co.*	2,682.24
Midvale Steel Co	2,933.70

*Accepted.

†No award.

Proposals for naval supplies for the navy-yard, Boston, Mass., under Bureau advertisement dated September 19, 1892; opened October 11, 1892.

Class 1.—Brushes, etc.:	
Manhattan Supply Co. *	$25.50
Ansel W. Paine	39.00
Class 2.—Shingles:	
S. C. Forsaith Machine Co.	339.45
J. A. Wetherbee	348.75
James & Abbott *	334.80
Ansel W. Paine	406.41
Class 3.—Molding sand, etc.:	
S. W. Niemeyer	191.00
Clarence W. Reed *	88.00
Thompson C. Gill & Co	119.34
Manhattan Supply Co	148.00
Ansel W. Paine	101.00
Class 4.—Coke, etc.:	
Ansel W. Paine*	114.00
Class 5.—Ladles, etc.:	
S. C. Forsaith Machine Co.	1,150.00
Clarence N. Reed *	160.60
Thompson C. Gill & Co	288.50
McFadden Co	170.42
Manhattan Supply Co	326.50
Ansel W. Paine	308.90
Class 6.—Hemlock boards:	
S. C. Forsaith Machine Co.	$155.00
J. A. Netherbee	150.00
James & Abbott *	140.00
Ansel W. Paine	220.00
Class 7.—Cupola furnace:	
E. P. Cutler & Co. *	375.00
Manhattan Supply Co	1,497.00
Class 8.—Blower:	
S. C. Forsaith Machine Co.	41.16
Manhattan Supply Co	147.50
B. F. Sturtevant	41.25
Class 9.—Paints:	
Gould & Cutler*	45.00
Aquila Rich	48.05
Manhattan Supply Co	50.60
Smith, Kline & French Co.	46.00
Class 10.—Miscellaneous:	
Clarence N. Reed *	39.00
Thompson C. Gill & Co	51.40
Manhattan Supply Co	48.25
Ansell W. Paine	59.60

Proposals for gas oil, etc., for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated September 26, 1892; opened October 11, 1892.

Class 1.—Gas oil:	
Gould & Cutler * †	$675.00
Fiske Brothers	675.00
Class 2.—Kerosene oil:	
Gould & Cutler *	$16.00
Class 3. — Lathe pattern-makers:	
Manhattan Supply Co. *	$609.50

Proposals for naval supplies for the New York navy-yard, under Bureau advertisement dated September 24, 1892; opened October 11, 1892.

Class 1.—Oil cups, etc:	
Donegan & Swift	$207.20
E. T. Tweedy	244.20
Charles A. Moore	228.32
S. C. Forsaith Machine Co.	385.08
Harry L. Briggs *	197.92
Class 2.—Yellow pine:	
Charles E. Pell	2,446.00
Eppinger & Russell	2,000.00
Joseph W. Duryee	1,995.00
Watson & Pittinger *	1,845.00
William D. Wheelwright	1,890.00
George L. Neville	2,099.00
Class 3.—Tiles:	
Charles E. Pell	1,968.50
Joseph W. Duryee	1,950.00
William Beard	1,650.00
Watson & Pittinger *	1,497.00
George L. Neville	2,250.00
Class 4.—Hardware:	
Manhattan Supply Co	94.70
Harry L. Briggs *	49.16
Class 5.—Pump, etc.:	
Charles A. Moore	$35.00
Manhattan Supply Co	25.70
Class 6.—Paint:	
Aquila Rich *	17.00
Fiske Brothers	19.83
Manhattan Supply Co	19.40
Smith, Kline & French Co.	17.60
Shoemaker & Busch	20.13
Class 7.—Cotton waste:	
Charles E. Ahrens	794.00
Donegan & Swift *	770.00
Tissot & Schultz	850.00
Fiske Brothers . bid A	850.00
Fiske Brothers . bid B	800.00
Charles A. Moore	792.00
Manhattan Supply Co	820.00
Ansel W. Paine	840.00
Harry L. Briggs	800.00
Smith, Kline & French Co.	800.00

* Accepted.

† By lot.

Proposals for pipe, etc., for the Naval Academy, Annapolis, Md., under Bureau
tisement dated September 21, 1892; opened October 11, 1892.

Class 1.—Pipe, etc.:	
S. C. Forsaith Machine Co.	$416.94
E. T. Tweedy*	367.02
Reuter & Mallory	429.90
A. P. Swoyer & Co	465.42
J. H. Chesley & Co	443.90
Manhattan Supply Co	428.14
Geo. L. Neville	406.70
Class 2.—Fire brick:	
Reuter & Mallory*	34.50
Manhattan Supply Co	37.50
Geo. L. Neville	46.50
Class 3.—Pipe covering:	
Wm. B. Morgan. bid A	
Wm. B. Morgan. bid B	
S. C. Forsaith Machine Co.	
E. T. Tweedy	
McFadden Co	
Tissot & Schultz	
Reuter & Mallory	
A. P. Swoyer & Co.*	
Manhattan Supply Co	
Thompson C. Gill & Co	
Geo. L. Neville	

Proposals for cotton canvas, etc., for the navy-yard, Mare Island, under Bureau adver
tisement dated September 22, 1892; opened October 18, 1892.

Class 1.—Cotton canvas:	
Lewis Anderson & Co.*	$1,106.20
Chas. F. Park	1,114.00
Manhattan Supply Co	1,236.90
Class 2.—Wire rope:	
S. C. Forsaith Machine Co.	52.50
Miller, Sloss & Scott*	37.50
Thompson C. Gill & Co	44.25
Class 3.—Pipe fittings:	
S. C. Forsaith Machine Co.	
Albert Gallatin*	
Miller, Sloss & Scott	
Oscar J. Backus	
Class 4.—Stationery:	
Miller, Sloss & Scott	
Payot, Upham & Co.*	

Proposals for supplies for the New York navy-yard, under Bureau advertisement
October 11, 1892; opened November 10, 1892.

Class 1.—Iron:	
S. C. Forsaith Machine Co.*	$101.25
Thompson C. Gill & Co	112.28
Class 2.—Paints:	
Manhattan Supply Co	79.35
Chas. M. Childs & Co.*	64.10
Ira B. White	90.00
J. B. Morrell & Co	73.50
Aquila Rich	68.80
Chas. H. Pleasants	84.05
Fiske Bros	65.65
Class 3.—White lead:	
Geo. L. Neville	225.00
Smith, Kline & French Co.*	188.70
Manhattan Supply Co	222.00
Chas. M. Childs & Co	202.50
Ira B. White	192.00
J. B. Morrell & Co	210.00
Aquila Rich	197.40
Chas. H. Pleasants	217.50
Fiske Bros	222.00
Class 4.—Hawse-pipe plugs:	
Manhattan Supply Co.*	238.00
Eugene L. Maxwell	317.60
Class 5.—Sheaves:	
Tissot & Schultz	538.21
Geo. L. Neville	639.88
Manhattan Supply Co	548.22
Ira B. White	538.21
J. B. Morrell & Co	541.30
Harry L. Briggs	537.10
Eugene L. Maxwell*	531.66
Class 6.—Nuts, etc.:	
Geo. L. Neville*	337.42
J. H. Sternbergh & Son	459.72
Frank H. Woodruff & Co.	488.50
Manhattan Supply Co	[illegible]
Class 6—Continued.	
Wm. A. Wheeler	
Harry L. Briggs	
Eugene L. Maxwell	
Class 7.—Brushes, etc.:	
Tissot & Schultz*	
Manhattan Supply Co	
Ira B. White	
Watson & Pittinger	
Thompson C. Gill & Co	
Class 8.—Twine, etc.:	
Tissot & Schultz*	
Geo. L. Neville	
Manhattan Supply Co	
Wm. A. Wheeler	
Class 9.—Forges, etc.:	
Manhattan Supply Co.*	254.97
Wm. A. Wheeler	266.40
Harry L. Briggs	264.17
Eugene L. Maxwell	276.66
Class 10.—Leather: ‡	
Tissot & Schultz	154.50
Geo. L. Neville	150.00
Manhattan Supply Co	83.00
Ira B. White†	73.10
Wm. A. Wheeler	164.50
Stevenson Bros. & Co	173.40
Harry L. Briggs†	61.75
Chas. H. Pleasants	137.90
Eugene L. Maxwell	179.30
Class 11.—Hickory poles:	
Manhattan Supply Co.*	
J. B. Morrell & [illegible]	
[illegible]	
[illegible]	

*Accepted.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 12.—Pulley blocks:	
S. C. Forsaith Machine Co.	$393.50
Tissot & Schultz	671 00
McFadden Co	405.89
Manhattan Supply Co	480.40
J. B. Morrell & Co	556.00
Donegan & Swift	411.50
Harry L. Briggs	416.14
Eugene L. Maxwell	364.80
Class 13.—Drills, etc.:*	
S. C. Forsaith Machine Co	239.45
Tissot & Schultz	171.72
McFadden Co	207.23
A. P. Swoyer & Co	210.87
Manhattan Supply Co	184.45
Wm. A. Wheeler	160.60
Harry L. Briggs	204.47
Eugene L. Maxwell	201.57
Class 14.—Tobins bronze:	
George L. Neville	273.30
A. P. Swoyer & Co	279.00
Ira B. White	289.85
Ansonia Brass & Copper Co.† ‡	263.50
Chas. H. Pleasants	278.84
Colwell Lead Co	263.50
Class 15.—Copper:	
S. C. Forsaith Machine Co.	557.86
George L. Neville	562.17
Frank H. Woodruff & Co.	612.00
A. P. Swoyer & Co	566.28
Manhattan Supply Co	542.88
Ira B. White	602.78
Wm. A. Wheeler	560.46
Randolph & Clowes	524.16
Donegan & Swift	572.83
Ansonia Brass & Copper Co.†	514.80
Chas. H. Pleasants	579.94
Colwell Lead Co	599.04
J. F. Friedenstein	576.57
Class 16.—Gaskets, etc.:	
Tissot & Schultz	280.20
Gutta-percha and Rubber Manufacturing Co	193.60
Manhattan Supply Co	375.30
Boston Woven Hose and Rubber Co	99.30
Wm. A. Wheeler	132.29
Stevenson Bros. & Co	219.33
Revere Rubber Co	339.30
Aquila Rich	133.20
Harry L. Briggs	145.17
Chas. H. Pleasants	300.80
John Simmons Co.†	77.10
Eugene L. Maxwell	252.30
Imperial Rubber Co	186.50
Colwell Lead Co	162.75
Class 17.—Alcohol:	
Aquila Rich†	72.00
Chas H. Pleasants	85.50
Class 18.—Acid:	
Tissot & Schultz	38.94
Manhattan Supply Co.†	36.20
Chas. M. Childs & Co	68.50
Aquila Rich	45.47
Chas. H. Pleasants	45.15
Class 19*a*.—Pipe fittings:	
S. C. Forsaith Machine Co.	$2,433.88
A. P. Swoyer & Co	2,872.27
Manhattan Supply Co	2,323.07
E. I. Tweedy†	2,088.18
Kennedy Valve Manufacturing Co	2,113.27
Donegan & Swift	2,605.44
John Simmons Co	2,255.61
Morse Burtis	2,274.45
Colwell Lead Co	2,592.30
Henry McShane Manufacturing Co	2,152.59
Class 19*b*.—Brass pipe:	
S. C. Forsaith Machine Co.	5,749.17
Bloomsburg Brass and Copper Co.†	4,947.19
Frank H. Woodruff & Co.	5,393.13
A. P. Swoyer & Co	5,682.32
Manhattan Supply Co	5,553.76
Wm. A. Wheeler & Co	5,716.67
Randolph & Clowes	5,292.24
Donegan & Swift	5,477.14
John Simmons Co	5,341.41
Chas. Millar & Son	6,148.31
Morse Burtis	5,236.04
Colwell Lead Co	5,811.55
Class 20.—Valves, etc.:	
S. C. Forsaith Machine Co.	2,352.90
Frank H. Woodruff & Co.	2,915.00
Manhattan Supply Co	1,770.30
Kennedy Valve Manufacturing Co.†	1,460.44
Donegan & Swift	2,184.75
Aquila Rich	2,875.01
John Simmons Co	1,538.54
Colwell Lead Co	1,608.87
Class 21.—Pumps, etc:	
Wm. Bishop†	1,497.00
Class 22.—Wrenches, etc:	
Tissot & Schultz	226.52
McFadden Co	236.24
A. P. Swoyer & Co	250.52
Manhattan Supply Co	235.97
Wm. A. Wheeler	242.84
Donegan & Swift	248.45
Harry L. Briggs	228.22
Eugene L. Maxwell†	186.36
Class 23.—Files:	
Tissot & Schultz	97.30
Frank H. Woodruff & Co.	113.90
McFadden Co	98.47
A. P. Swoyer & Co	96.3[illegible]
Manhattan Supply Co	89.85
Wm. A. Wheeler	97.02
J. B. Morrell & Co	96.44
Donegan & Swift	134.49
Harry L. Briggs	89.98
Thompson C. Gill & Co	118.11
Morse Burtis	115.85
Eugene Maxwell†	83.91
Class 24.—Candles:	
Tissot & Schultz	52.00
Manhattan Supply Co.	51.40
J. B. Morrell & Co.	70.50
Chas. H. Pleasants†	38.49

*Award canceled. †Accepted. ‡By lot.

Proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated October 8, 1892; opened November 10, 1892.

Class 1.—Crane:	
Yale & Towne Manufacturing Co.	$8,898.00
Wm. Sellers & Co.*	4,500.00
Morgan Engineering Co.	5,340.00
Class 2.—Supports for crane:	
Manhattan Supply Co.	4,180.00
Morgan Engineering Co.*	4,015.00
Class 3.—Steel rails:†	
Phila. Machine and Supply Co	131.25
S. C. Forsaith Machine Co.	95.00
Morgan Engineering Co.	150.00
Thompson C. Gill & Co.	74.50
Class 4.—Profiling machine:	
Manhattan Supply Co.*	2,647.00
Class 5.—Planing Machine:	
Eugene L. Maxwell	3,300.00
Dietrick & Harvey Machine Co	3,550.00
Wm. Sellers & Co	3,870.00
Hill, Clark & Co	4,520.00
Manhattan Supply Co	3,540.00
The Garvin Machine Co.‡	3,850.00
S. C. Forsaith Machine Co.*	3,126.00
Fitchburg Machine Co	3,752.00
Niles Tool Works Co	3,820.00
Bement Miles & Co	5,300.00
Class 6.—Gear-cutting machine:	
Eugene L. Maxwell	2,400.00
Wm. Sellers & Co	2,610.00
The Garvin Machine Co.‡	1,650.00
Gould & Eberhardt*‡	2,400.00
Edwin Harrington Son & Co	2,500.00
Class 7.—Milling machine:	
Hill, Clark & Co	1,018.00
Manhattan Supply Co	760.00
The Garvin Machine Co.‡	1,203.75
Pedrick & Ayer	1,000.00
Brown & Sharpe Manufacturing Co*	1,150.00
Class 8.—Turning and boring mills:	
Bridgeport Machine Tool Works*	1,450.00
Niles Tool Works Co	1,795.00
Class 9.—Screw machine:	
Bridgeport Machine Tool Works	1,764.50
S. C. Forsaith Machine Co.*	1,517.00
Niles Tool Works Co.	1,750.00
Class 10.—Boring and drilling machine:	
Manhattan Supply Co	3,397.40
S. C. Forsaith Machine Co.	2,885.00
Niles Tool Works Co.*	2,685.00
Bement, Miles & Co	3,150.00
Class 11.—Radial drilling machine:	
Eugene L. Maxwell	$900.00
Wm. Sellers & Co	1,250.00
Manhattan Supply Co	670.00
The Universal Radial Drill Co	679.00
S. C. Forsaith Machine Co.	631.00
Edwin Harrington Son & Co	770.00
Niles Tool Works Co	645.00
Bement, Miles & Co	750.00
Lodge & Davis Machine Tool Co.*	600.00
Class 12.—Crank shaping machine:	
Wm. H. Warren M'ch'e Tool W'k's, bid A	5,000.00
Wm. H. Warren M'ch'e Tool W'k's, bid B	5,625.00
Wm. Sellers & Co	4,400.00
Manhattan Supply Co	4,850.00
Philadelphia Machine and Supply Co	4,000.00
The Garvin Machine Co.‡	1,200.00
Pedric & Ayer	2,500.00
Fitchburg Machine Works	3,430.00
Bement, Miles & Co.*	4,550.00
Class 13.—16-inch slotting machine:	
Wm. Sellers & Co	2,600.00
Manhattan Supply Co	3,0[illegible]3.00
Niles Tool Works Co	2,185.00
Bement, Miles & Co.*	1,950.00
Class 14.—24-inch slotting machine:	
Wm. Sellers & Co	5,040.00
Niles Tool Works Co, bid A.	3,600.00
Niles Tool Works Co, bid B.	3,450.00
Bement, Miles & Co	4,300.00
Class 15.—Die-sinking machine:	
Newton Machine Tool Works, bid A.	517.15
Newton Machine Tool Works, bid B.	1,127.15
Manhattan Supply Co.*	429.90
Class 16.—Shafting:	
Geo. L. Neville	1,614.20
Geo. C. Howard	1,690.56
Wm. Sellers & Co	1,587.18
Hill, Clark & Co	1,395.91
Donegan & Swift*	1,360.00
The Geo. V. Cresson Co.	1,424.49
Philadelphia Machine and Supply Co	1,392.59
A. & F. Brown	Informal
S. C. Forsaith Machine Co.	1,620.80
McFadden Co	1,779.00

Proposals for supplies for the navy-yard, League Island, Pennsylvania, under Bureau advertisement dated October 7, 1892; opened November 10, 1892.

Class 1:	
Chas. J. Field*	$347.00
Appleton M'f'g Co., bid A	360.00
Appleton M'f'g Co., bid B	510.00
Class 2:	
Chas. J. Field	
Geo. L. Nevil	
A. P	

*Accepted.

[illegible]

Proposals for supplies for the navy-yard, League Island, Pennsylvania, etc.—Continued.

Class 3:	
Chas. J. Field	$55.00
Geo. L. Neville	60.00
Thompson C. Gill & Co	58.80
Shoemaker & Busch	54.40
A. P. Swoyer & Co	54.90
Class 4:	
Charles J. Field*	9.80
Geo. L. Neville	20.00
Thompson C. Gill & Co	14.90
Shoemaker & Busch	12.40
A. P. Swoyer & Co	11.00
Paul J. Field, jr	14.40
Class 5:	
Charles J. Field	9.70
Thompson C. Gill & Co	21.00
A. P. Swoyer & Co.*	9.31
Paul J. Field, jr	10.39
Class 6:	
Geo. L. Neville	510.00
Edwin A. Gaskill*	280.50
Charles Este	612.00
Class 7:	
S. C. Forsaith Machine Co	$1,168.50
Geo. L. Neville	1,050.00
Edwin A. Gaskell*	726.50
Charles Este	895.00
Chas. A. Maule	812.50
Class 8:	
S. C. Forsaith Machine Co	173.00
Chas. J. Field	125.00
McFadden Co.*	122.00
A. P. Swoyer & Co	250.00
Phila. Mach. and Supply Co	132.65
Class 9:	
Smith, Kline & French Co	132.00
Chas. J. Field	164.40
Geo. L. Neville	213.00
Shoemaker & Busch	134.00
A. P. Swoyer & Co	149.20
Chas. M. Childs & Co.*	119.60
Appleton M'f'g Co	165.50
Aquila Rich	132.00

Proposals for supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated October 6, 1892; opened November 10, 1892.

Class 1:	
S. C. Forsaith Machine Co.*	$101.25
Thompson C. Gill & Co	123.53
Class 2:	
David Duncan & Son	2,320.00
Class 2—Continued.	
J. Albert Walker*	$2,000.00
Class 3:	
David Duncan & Son*	371.25
J. Albert Walker	375.00

Proposals for supplies for the navy-yard, Mare Island, California, under Bureau advertisement dated October 10, 1892; opened November 10, 1892.

Class 1.—Gravel, sand, etc.:	
Aden Bros	$592.00
A. S. Carman*	252.35
Abraham Powell	303.90
William Walker	388.30
Class 2.—Cement:	
Aden Bros	682.50
A. S. Carman*	552.30
Alfonso A. Wigmore	609.00
Abraham Powell	598.50
William Walker	682.50
Husband & Brooks	504.00
Class 3.—Brick:	
A. S. Carman*	1,031.38
Alfonso A. Wigmore	1.155.40
Abraham Powell	1,884.00
William Walker	1,155.40
F. W. Kreling & Sons	1,378.00
Class 4.—Lime:	
Aden Bros	185.50
A. S. Carman*	162.18
Alfonso A. Wigmore	180.20
Abraham Powell	169.60
William Walker	179.14
F. W. Kreling & Sons	212.00
Class 5.—Glass:	
W. F. Whittier*	17,50
Miller, Sloss & Scott	21.25
Class 6.—Hardware:	
Miller, Sloss & Scott	67.95
Dunham, Carrigan & Hayden Co.*	53.86
Class 7.—Oregon pine:	
A. S. Carman*	$313.63
Alfonso A. Wigmore	404.02
Abraham Powell	392.81
William Walker	382.82
F. W. Kreling & Sons	354.48
Class 8.—Iron:	
S. C. Forsaith Machine Co.	93.32
Alfonso A. Wigmore	55.69
Thompson C. Gill & Co	72.09
Miller, Sloss & Scott*	51.09
Dunham, Carrigan & Hayden Co	52,49
F. W. Kreling & Sons	58.30
Class 9.—Tin:	
S. C. Forsaith Machine Co.	593.35
Thompson C. Gill & Co.*	460.84
Miller, Sloss & Scott	528.25
Holbrook, Merrill & Stetson	509.50
Class 10.—Linseed oil:	
N. F. Whittier*	90.40
American Oil Co	95.80
Chas. M. Childs & Co	103.00
Class 11.—Pillar crane:	
Marshutz & Cantroll	2,945.00
Miller, Sloss & Scott*	1,840.00
Class 12.—Shingles:	
A. S. Carman*	51.48
Alfonso A. Wigmore	58.30
Abraham Powell	60.50
Wm. Walker	53.68
F. W. Kreling & Sons	55.00

*Accepted.

Proposals for supplies for the navy-yard, Mare Island, California, etc.—**Continued.**

Class 13.—Paints:	
W. F. Whittier	$131.26
Chas. M. Childs & Co.*	130.62
Class 14.—Alcohol:	
W. F. Whittier*	11.75
Class 15.—Pipe, etc.:	
Miller, Sloss & Scott	92.61
Dunham, Carrigan & Hayden Co	85.21
Holbrook, Merrill & Stetson	Informal.
L. M. Kellogg*	79.85
Class 16.—Iron:	
S. C. Forsaith Machine Co.	45.95
Thompson C. Gill & Co	45.66
Miller, Sloss & Scott	40.02
Dunham, Carrigan & Hayden Co	33.36
Holbrook, Merrill & Stetson	31.87
L. M. Kellogg	32.61
Class 17.—Wash trays:	
Holbrook, Merrill & Stetson*	90.00
Class 18.—White lead:	
W. F. Whittier*	139.56
Standard Oil Co	139.56
Chas. M. Childs & Co	154.00
Class 19.—Spikes:	
S. C. Forsaith Machine Co.	100.00
Thompson C. Gill & Co	67.80
Miller, Sloss & Scott	49.00
Dunham, Carrigan & Hayden Co.*	48.80
Class 20.—Oregon pine:	
A. S. Carman*	1,625.80
Alphonso A. Wigmore	2,336.30
Class 20—Continued.	
Abraham Powell	$2,650.00
Dunham, Carrigan & Hayden Co	Informal.
Wm. Walker	2,433.58
F. W. Kreling & Sons	2,120.90
Class 21.—Iron:	
Thompson C. Gill & Co	27.50
Miller, Sloss & Scott*	12.95
Class 22.—Lubricating and burning oil:	
W. F. Whittier*	3,625.00
Columbia Oil Co	4,600.00
Arctic Oil Works	3,750.00
Class 23.—Cylinder oil:	
W. F. Whittier*	340.00
American Oil Co	380.00
Standard Oil Co	350.00
Leonard & Ellis	400.00
Columbia Oil Co	560.00
Vacuum Oil Co	585.00
Arctic Oil Works	375.00
Class 24.—Bituminous coal:	
John L. Howard	14,980.00
Husband & Brooks*	14,760.00
South Prairie Coal Co	13,000.00
Henry Rosenfield	14,940.00
R. D. Chandler	18,000.00
Class 25.—Lubricating oil:	
W. F. Whittier	200.00
American Oil Co.*	140.00
Columbia Oil Co	360.00
Class 26.—Cylinder oil:	
W. F. Whittier*	170.00
American Oil Co	190.00
Standard Oil Co	175.00
Leonard & Ellis	200.00
Columbia Oil Co	280.00

Proposals for anchors for the navy-yard, League Island, Pennsylvania, under Bureau advertisement dated October 26, 1892; opened November 11, 1892.

Class 1:	
Norristown Steel Co	$24,000.00
Standard Steel Casting Co	24,400.00
Midvale Steel Co	19,560.00
Duquesne Forge Co	33,600.00
Class 1—Continued.	
Patterson Iron Co	$23,200.00
The Penn Steel Casting & Machine Co	16,000.00

Proposals for supplies for the New York navy-yard under Bureau advertisement dated November 4, 1892; opened November 21, 1892.

Class 1.—30,000 yards unbleached duck:†	
Tissot & Schultz	$3,210.00
J. B. Morrell & Co	3,300.00
Joseph Wechsler	3,300.00
Class 2.—5,000 yards blue flannel:	
Tissot & Schultz	5,000.00
B. Y. Pippey & Co.*	4,700.00
Class 3.—1,000 pocket handkerchiefs:†	
Tissot & Schultz	80.00
Class 5.—1,500 papers needles:	
Tissot & Schultz	120.00
Class 6.—6,000 jack knives:†	
Ansel W. Paine	$2,400.00
Tissot & Schultz	1,980.00
Manhattan Supply Co	2,394.00
Class 7.—2,500 spoons:†	
Ansel W. Paine	337.50
Tissot & Schultz	352.50
Harry L. Briggs	370.00
Manhattan Supply Co	350.00
Francis T. Witte Hardware Co	400.00
Joseph Wechsler	400.00
Class 8.—500 can-openers:	
Ansel W. Paine	12.50

*Accepted.

†No award.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 8—Continued.	
Tissot & Schultz	$19.50
Harry L. Briggs	24.50
Manhattan Supply Co	20.00
Francis T. Witte Hardware Co	15.00
Joseph Wechsler	30.00
Class 9.—1,000 razors: †	
Tissot & Schultz	600.00
Manhattan Supply Co	824.00
Francis T. Witte Hardware Co	700.00
Class 10.—1,500 forks: †	
Ansel W. Paine	202.50
Tissot & Schultz	211.50
Harry L. Briggs	222.00
Manhattan Supply Co	210.00
Francis T. Witte Hardware Co	240.00
Joseph Wechsler	345.00
Class 11.—5,000 pounds tea:	
Robt. G. Thomas	1,483.00
Francis H. Leggett & Co.*	1,438.50
Chas. E. Ahrens	1,675.00
John J. O'Rourke	1,473.50
Class 12.—80,000 pounds salt pork in half barrels, 39,000 pounds in barrels:	
Chas. F. Mattlage	11,557.30
Figge & Brother*	11,453.10
Class 13.—32,000 pounds salt beef in half barrels, 15,600 pounds in barrels:	
Chas. F. Mattlage*	2,585.48
J. B. Morrell & Co	2,651.20
Chas. E. Ahrens	2,737.00
Class 14.—45,000 pounds roast beef:	
H. M. Anthony	3,000.00
Armour Co	3,206.25
Louis H. Heymann	2,781.00
Francis H. Leggett & Co.*	2,578.50
Class 15.—30,000 pounds mutton:	
Francis H. Leggett & Co.*	2,157.00
Kemp, Day & Co	2.679.00
Class 16.—53,000 pounds corned beef:	
H. M. Anthony	3,919.79
Louis H. Heymann*	3,725.90
Francis H. Leggett & Co.	4,770.00
Class 17.—7,000 pounds brawn:	
Francis H. Leggett & Co.*	630.00
Class 18.—53,500 pounds ham:	
Francis H. Leggett & Co.*	7,880.55
Class 19.—6,660 pounds bacon:	
Charles F. Mattlage	814.52
Kemp, Day & Co.*	785.88
Charles E. Ahrens	865.80
Class 20.—37,500 pounds sausage:	
H. M. Anthony	4,804.69
Francis H. Leggett & Co.*	3,558.75
Class 21.—4.000 pounds fish:	
Charles F. Mattlage	369.20
Kemp, Day & Co.*	364.00
Charles E. Ahrens	380.00
Class 22.—1,000 pounds shoes:	
Watsontown Boot and Shoe Co	$1,480.00
Tissot & Schultz	2,500.00
Class 23.—Hardware:	
Ansel W. Paine	614.71
Harry L. Briggs*	476.74
Manhattan Supply Co	646.43
Class 27.—Nails, etc.	
Ansel W. Paine	120.29
Harry L. Briggs*	97.14
Manhattan Supply Co	120.95
Class 25.—Brushes: †	
Tissot & Schultz	594.40
J. B. Morrell & Co	718.81
Harry L. Briggs	691.43
Manhattan Supply Co	750.10
Class 26.—Miscellaneous:	
Ansel W. Paine	243.10
Harry L. Briggs	210.20
Manhattan Supply Co	196.15
Charles H. Pleasants*	190.86
Class 27.—Pipe fittings:	
Colwell Lead Co	21.52
Manhattan Supply Co	20.32
Class 28.—Locks:	
Manhattan Supply Co.*	86.80
Class 29.—Tools:	
Ansel W. Paine	936.22
Tissot & Schultz	956.25
Harry L. Briggs*	722.04
Manhattan Supply Co	815.87
Francis T. Witte Hardware Co	1,081.95
Class 30.—Files: †	
Ansel W. Paine	347.85
Tissot & Schultz	269.28
Harry L. Briggs	285.63
Manhattan Supply Co	281.34
Francis T. Witte Hardware Co	297.19
Class 31.—Cylinder oil:	
Borne, Scrymser & Co	135.00
T. J. Gilroy & Co	125.00
Fiske Brothers	112.50
Vacuum Oil Co	162.50
Class 32.—Engine oil:	
Borne, Scrymser & Co.*	69.00
T. J. Gilroy & Co	102.00
Fiske Brothers	120.00
Vacuum Oil Co	150.00
Class 33.—Sperm oil:	
William McDonagh	177.75
Aquila Rich	177.25
Smith, Kline & French Co.	239.74
Boone, Scrymser & Co.*	166.00
T. J. Gilroy & Co	198.25
Charles M. Childs & Co	232.00
Fiske Brothers	184.50
Class 34.—White and red lead:	
Aquila Rich	2,556.40
Smith, Kline & French Co.*	2,530.84
James H. Taylor	2,720.25
Charles M. Childs & Co	2,548.72
Class 35.—White zinc, American:	
J. B. Morrell & Co	1,347.00
Aquila Rich*	1,133.40

*Accepted.

† No award.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 35—Continued.	
Smith, Kline & French Co.	$1,357.50
James H. Taylor	1,170.00
Charles M. Childs & Co	1,255.80
Harrison Bros. & Co	1,420.50
Class 36.—White zinc, French:	
J B Morrell & Co	175.80
Aquila Rich	169.80
Smith, Kline & French Co.	170.00
James H. Taylor*	154.00
Charles M. Childs & Co	169.00
Harrison Bros. & Co	189.60
Class 37.—Window glass:	
William McDonagh	93.95
Smith, Kline & French Co.*	47.84
Manhattan Supply Co	58.99
Charles H Pleasants	53.87
Class 38.—Paints	
William McDonagh	1,310.00
Aquila Rich*	1,267.34
Smith, Kline & French Co.	1,368.04
James H. Taylor	1,293.13
Charles M. Childs & Co	1,310.29
Class 39.—Alcohol:	
Aquila Rich	591.00
Smith Kline & French Co.	572.50
Charles H Pleasants	650.00
Class 40.—White pine:	
S. C Forsaith Machine Co.	8,255.00
Charles E. Pell*	4,311.50
Watson & Pittinger	4,403.00
Class 41.—White wood:	
S. C. Forsaith Machine Co.	768.00
Charles E. Pell*	552.50
Watson & Pittinger	577.00
Class 42.—Mahogany:	
Charles E. Pell*	1,972.25
Watson & Pittinger	2,035.00
Class 43.—Black walnut:	
Charles E. Pell	1,295.20
Watson & Pittinger	1,155.00
Class 44. Hoisting winch:	
The American Ship Windless Co.*	1,400.00
Class 45.—Shafting:	
Donegan & Swift*	145.70
Manhattan Supply Co	192.50
Class 46.—Belting:	
Donegan & Swift	339.93
Tissot & Schultz	305.60
Page Belting Co	292.63
Loeb Brothers	253.55
Manhattan Supply Co.*	247.85
Class 47.—Lamps:	
Tissot & Schultz	308.00
International Trading and Electric Co.*	280.00
Class 48.—W. O. Staves:	
Charles E. Pell	213.00
Watson & Pittinger*	169.25
Manhattan Supply Co	172.75
Class 49.—Muslin, etc.:	
Tissot & Schultz	66.60
J. B. Morrell & Co	72.00
Manhattan Supply Co	65.72
Charles H. Pleasants*	58.17

Class 50.—Box boards:	
S. C Forsaith Machine Co	$137.50
Chas. E. Pell	94.50
Watson & Pittinger	130.00
Class 51.—Spruce, ash, etc.:	
Chas. E. Pell	191.50
Watson & Pittinger*	188.00
Class 52.—Iron, round:	
Thompson C. Gill & Co*.	43.99
Frank H. Woodruff & Co.	52. 5
Class 53.—Tool steel	
Thompson C. Gill & Co*.	64.63
Class 54.—Yellow pine:	
S. C. Forsaith Machine Co	306.90
Chas. E. Pell	263.19
Watson & Pittinger*	213.90
Class 55.—Platform scale:	
Thompson C. Gill & Co	79.00
Tissot & Schultz	62.00
J B. Morrell & Co	85.00
Manhattan Supply Co. *	49.90
Class 56.—Rubber hose (300 feet):	
Boston Woven Hose and Rubber Co*	192.00
Page Belting Co	264.00
Harry L. Briggs	207.00
Aquila Rich	201.00
Gutta Percha and Rubber Mfg. Co	221.70
Class 57.—Packing, etc.:	
Page Belting Co.*	15.00
Harry L. Briggs	24.50
Aquila Rich	19.00
Manhattan Supply Co	27.80
Class 58.—Ranges	
Royal E. Dean bid A	3,821.00
bid B	4,565.80
Duparquet, Huot & Moneuse*	3,942.00
Class 59.—Electric fixtures	
International Trading and Electric Co*	1,187.42
Class 60. Tools, wire, etc.:†	
Tissot & Scultz	692.84
Harry L. Briggs	876.61
Manhattan Supply Co	738.25
International Trading and Electric Co	752.24
Class 61.—Navigation supplies:†	
Tissot & Schultz	480.90
Manhattan Supply Co	531.12
Class 62.—Thermometers	
Manhattan Supply Co.*	136.80
Class 63.—Lamps, etc.:	
Wm. Porter's Sons	286.10
Manhattan Supply Co.*	230.90
Class 64.—50,000 pounds sugar in half-barrels, 20,000 pounds in barrels:	
Francis H. Leggett & Co.	3,404.00
Manhattan Supply Co	3,425.00
Chas. E. Aherns	3,500.00
John J. O'Rourke *	3,378.07

* Accepted.

† No award.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 65*a*.—Plates, steel:	
The Wellman Iron and Steel Co.*	$1,497.[illegible]6
Frank H. Woodruff & Co.	1,685.29
Manhattan Supply Co	1,750.72
Class 65*b*.—Shapes, steel:	
Manhattan Supply Co.*	217.16
Class 66.—Nuts, washers:	
J. H. Sternbergh & Son*	209.34
Class 67.—Rivets:	
J. H. Sternbergh & Son	$207.42
Frank H. Woodruff & Co.*	150.84
Class 69.—100,000 pounds salt-water soap:	
Tissot & Schultz	5,000.00
Chas. J. McKeone*	3,890.00
Manhattan Supply Co	3,930.00

Proposals for supplies for the navy-yard, League Island, Pa., under Bureau advertisement dated October 31, 1892; opened November 22, 1892.

Class 1.—Nails, etc.:	
W. H. & G. W. Allen	$199.50
Chas. J. Field	201.98
A. P. Swoyer & Co	207.29
Paul J. Field, jr	231.41
Manhattan Supply Co	296.38
Thompson, C. Gill & Co	237.58
Class 2.—Belting:	
Stevenson Bro. & Co	69.50
Chas. J. Field	44.90
A. P. Swoyer & Co*	35.36
Manhattan Supply Co	39.63
Geo. L. Neville	41.82
Class 3.—Oil:	
Stevenson Brother & Co	91.00
Chas. J. Field*	57.50
A. P. Swoyer & Co	74.75
Chas. M. Childs & Co	77.00
Smith, Kline & French Co.	75.00
Chas. K. Smith & Co	74.50
Class 4.—Tools:	
W. H. & G. W. Allen	$117.29
Chas. J. Field*	93.78
A. P. Swoyer & Co	96.52
Paul J. Field, jr	191.69
Class 5.—Rope:	
Charles J. Field*	173.09
A. P. Swoyer & Co	195.15
McFadden Co	186.67
Smith, Kline & French Co.	186.67
Manhattan Supply Co	186.67
Thompson, C. Gill & Co	206.82
S. C. Forsaith Machine Co.	190.90
Geo. L. Neville	186.67
Class 6.—Tire bender:	
W. H. & G. W. Allen	45.00
Chas. J. Field	28.95
A. P. Swoyer & Co	30.45
Paul J. Field, jr	34.19
McFadden Co	44.50
S. C. Forsaith Machine Co.	34.90

Proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated November 1, 1892; opened November 22, 1892.

Class 1.—Tools:	
Manhattan Supply Co	$221.60
Harry L. Briggs	139.17
A. P. Swoyer & Co	142.76
The Philadelphia Machinery Supply Co	131.32
McFadden Co	128.09
Class 2.—Iron:	
Geo. L. Neville	1,099.75
The S. C. Forsaith Machine Co	834.20
J. B. Kendall	777.00
A. P. Swoyer & Co	725.00
Thompson C. Gill & Co	802.80
Brown & Co*	721.05
Class 3.—Forgings:	
The Midvale Steel Co	241.80
Class 4.—Castings:	
The Midvale Steel Co	681.75
Standard Steel Casting Co.	573.80
The Penn Steel Castings and Machine Co*	454.50
The Eureka Cast Steel Co.	499.95
Class 5.—Cutting-off saw:	
The S. C. Forsaith Machine Co	645.00
The Philadelphia Machinery Supply Co.*	587.00
McFadden Co	600.00
Class 6.—White pine:	
Edwin A. Gaskell*	$923.70
Class 7.—Slate, etc.:	
Geo. L. Neville	672.09
A. P. Swoyer & Co	1,128.90
J. T. Walker & Sons*	536.00
Standard Steel Casting Co.	630.03
Class 8.—White lead:	
Geo. L. Neville	188.50
Chas. Becker	176.80
Chas. M. Childs & Co	167.40
Hugh Reilley	169.00
Aquila Rich	169.26
Chas. H. Pleasants	195.00
Shoemaker & Busch	175.24
Geo. Ryneal, jr	177.30
Smith, Kline, & French Co.	163.54
Ira B. White*	159.64
Class 9.—Oil, etc.:	
Geo. L. Neville	142.85
Chas. Becker	124.19
Chas. M. Childs & Co	124.65
Hugh Reilley	122.10
Aquila Rich	123.00
Chas. H. Pleasants	136.21
Shoemaker & Busch*	120.05
Geo. Ryneal, jr	131.60
Smith, Kline & French Co.	128.00
Ira B. White	134.10

* Accepted.

Proposals for supplies for the navy-yard, Washington, D. C., etc.—Continued.

Class 10.—Lard oil:	
Geo. L. Neville	$2,268.00
Stevenson Bro. & Co	2,340.00
Chas. Becker*	2,220.00
Chas. M. Childs & Co	2,820.00
Fiske Bros	2,520.00
T. J. Gilroy & Co	2,400.00
Hugh Reilley	2,490.00
Geo. Ryneal, jr	2,250.00
Smith, Kline & French Co.	2,670.00
Ira B. White	2,310.00
The Manhattan Oil Co	2,700.00
Class 11.—T jacks:	
S. C. Forsaith Machine Co.	347.00
Manhattan Supply Co	360.00
Harry L. Briggs*	342.00
J. B. Kendall	353.50
A. P. Swoyer & Co	370.00
The Philadelphia Machinery Supply Co	345.88
McFadden Co	346.38
Ira B. White	349.80
Class 12.—Georgia pine:	
Edwin H. Gaskell *	1,293.64
Class 13.—Blocks:	
Manhattan Supply Co	43.20
Harry L. Briggs*	31.52
A. P. Swoyer & Co	35.36
McFadden Co	36.52
Ira B. White	50.90
Class 14.—Brushes:	
Charles Becker	36.50
Charles M. Childs & Co	33.00
Manhattan Supply Co	50.00
J. T. Walker & Sons	32.55
Hugh Reilley	23.00
Aquila Rich	22.00
Shoemaker & Busch*	18.00
McFadden Co	38.50
Geo. Ryneal, jr	24.98
Ira B. White	28.00
Class 15.—Rope:	
Manhattan Supply Co.	89.00
Charles H. Pleasants	89.42
Class 15—Continued.	
McFadden Co.	$90.50
Ira B. White	96.00
Class 16.—Screws:	
Manhattan Supply Co	98.62
Harry L. Briggs	92.07
A. P. Swoyer & Co	89.81
McFadden Co.*	80.50
Ira B. White	100.84
Class 17.—Hose:	
S. C. Forsaith Machine Co.	435.00
Manhattan Supply Co	220.00
Harry L. Briggs	280.00
The Page Belting Co	250.00
Gutta-Percha Rubber M'f'g Co.	600.00
The Phila. Machinery Supply Co	216.00
Aquila Rich	274.90
The Boston Woven Hose and Rubber Co	270.00
The New Jersey Car Spring and Rubber Co*	195.00
Class 18.—Coal oil:	
Stevenson Bro. & Co.	39.00
Chas. Becker	40.56
Chas. M. Childs & Co	93.60
J. B. Kendall	35.88
J. T. Walker & Sons	37.44
Hugh Reilley*	31.20
Aquila Rich	43.68
Chas. H. Pleasants	35.88
Geo. Ryneal, jr	34.32
Ira B. White	40.56
Class 19.—Paints:	
Chas. Becker	170.16
Charles M. Childs & Co.	188.02
Hugh Reilley	173.04
Aquila Rich*	165.34
Chas. H. Pleasants	182.12
Shoemaker & Busch	170.09
Geo. Ryneal, jr	194.68
Smith, Kline & French Co.	177.32
Ira B. White	169.85

Proposals for supplies for the navy yard, Mare Island, California, under Bureau advertisement dated October 29, 1892; opened December 1, 1892.

Class 1.—Pipe, etc.:	
W. W. Montague & Co	$825.77
Miller, Sloss & Scott	1,040.97
Holbrook, Merrill & Stetson *	796.46
Oscar J. Backus	978.62
T. W. Kreling & Sons	979.50
H. T. Lally	882.92
Class 2.—Flax canvas:	
J. B. Morrell & Co	1,550.00
Neville & Co.*	990.00
Manhattan Supply Co.	1,593.50
Class 3.—Cotton canvas:	
J. B. Morrell & Co	445.50
Neville & Co.*	340.00
Chas. H. Pleasants	450.00
Manhattan Supply Co	450.00
Class 4.—Knives:	
Miller, Sloss & Scott	$133.80
Chas. J. Kendry's Sons & Co	107.40
Manhattan Supply Co	101.00
Dunham, Carrigan & Hayden Co*	92.36
Class 5.—Brick:	
A. S. Carman*	267.58
The Union Pressed Brick and Terra Cotta Co	385.00
Wm. Walker	299.75
Abraham Powell	385.00
Geo. H. Wigmore	299.75
Class 6.—Lime:	
A. S. Carman*	130.05
Chas. J. Kendry's Sons & Co	135.15

*Accepted.

Proposals for supplies for the navy-yard, Mare Island, California, etc.—Continued.

Class 6.—Continued.	
Wm. Walker	$143.65
Abraham Powell	131.75
Geo. H. Wigmore	144.50
Class 7.—Cement:	
T. W. Grace & Co	$231.00
A. S. Carman*	173.58
Wm. Walker	214.50
Abraham Powell	184.80
Geo. H. Wigmore	201.50
Class 8.—Sand:	
A. S. Carman*	108.00
Wm. Walker	162.00
Abraham Powell	133.20
Class 9.—Hardware:	
Miller, Sloss & Scott	371.47
Thompson C. Gill & Co	382.05
Dunham, Carrigan & Hayden Co*	221.38
Class 10.—Lumber:	
A. S. Carman*	533.89
Wm. Walker	621.60
Abraham Powell	550.00
Class 10.—Continued.	
Geo. H. Wigmore	$647.95
T. W. Kreling & Sons	586.69
Class 11.—Galvanized iron:	
W. W. Montague & Co.*	54.20
Miller, Sloss & Scott	69.64
Holbrook, Merrill & Stetson	55.89
Thompson C. Gill & Co	78.34
S.C. Forsaith Machine Co	66.25
Dunham, Carrigan & Hayden Co	59.02
Class 12.—Paints:	
Chas. J. Kendry's Sons & Co	116.37
W. F. Whittier	112.64
Aquila Rich	132.89
Chas. H. Pleasants	137.19
Chas. M. Childs & Co.*	109.35
Class 13.—Wall paper, O. P.:	
Class 14.—Steel plates:	
Carnegie Steel Co., limited*	853.08

Proposals for supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated November 18, 1892; opened December 6, 1892.

Class 1.—Carriage bolts:	
Charles H. Pleasants	$16.78
Ansel W. Paine	27.00
S. C. Forsaith Machine Co.	26.50
Manhattan Supply Co	21.60
A. P. Swoyer & Co.*	10.60
Class 2.—Brushes:	
Charles H. Pleasants	39.68
Gould & Cutler	31.70
Chas. M. Childs & Co	46.65
Ansel W. Paine	27.50
Manhattan Supply Co	41.25
Shoemaker & Busch *	26.73
A. P. Swoyer	57.60
Class 3.—Shingles, etc.:	
Ansel W. Paine	142.50
S. C. Forsaith Machine Co.	133.75
John H. Broughton *	118.00
Class 4.—Hardware:	
Ansel W. Paine	35.10
Charles H. Pleasants	27.64
Manhattan Supply Co.*	27.55
Class 5.—Glass:	
Charles H. Pleasants	$28.31
Gould & Cutler	34.00
Ansel W. Paine	46.65
S. C. Forsaith Machine Co.	34.10
Manhattan Supply Co	29.30
Shoemaker & Busch *	22.10
Class 6.—White pine:	
Edwin A. Gaskill	423.52
S. C. Forsaith Machine Co.	416.50
John H. Broughton *	407.52
Class 7.—Paints:	
Charles H. Pleasants	92.00
Gould & Cutler	87.20
Aquila Rich	89.45
Charles M. Childs & Co.*	83.63
Shoemaker & Busch	87.83
Class 8.—Alcohol:	
Charles H. Pleasants	15.75
Gould & Cutler	12.00
Aquila Rich	12.10
Shoemaker & Busch	11.60

Proposals for supplies for the navy-yard, League Island, Pennsylvania, under Bureau advertisement dated November 17, 1892; opened December 6, 1892.

Class 1.—Brooms:	
McFadden Co	$50.30
A. P. Swoyer & Co	59.00
George L. Neville	56.00
Manhattan Supply Co.*	33.60
Paul J. Field, jr	98.00
Class 2.—Rope:	
John H. Tissot, jr	103.25
Chas. J. Field	91.00
McFadden Co	90.30
S. C. Forsaith Machine Co.	120.75
The Gutta-Percha and Rubber Manufacturing Co	87.50
Class 2.—Continued.	
Geo. L. Neville	$90.12
Thompson C. Gill & Co	131.25
Chas. H. Pleasants*	71.75
Class 3.—White pine:	
Edwin A. Gaskill	795.50
Geo. L. Neville*	666.00
Class 4.—Yellow pine:	
John C. Emmerson	1,130.00
B. G. Bailey	1,055.70
Edwin A. Gaskill*	747.50
Geo. L. Neville	1,130.00

* Accepted.

Proposals for supplies for the navy-yard, League Island, Pennsylvania, etc.—**Continued.**

Class 5.—Piles:	
B. G. Bailey*	$328.95
Edwin A. Gaskill*	352.75
Geo. L. Neville	340.00
Class 6.—Hose:	
McFadden Co	181.50
W. H. Sayen	255.00
Revere Rubber Co	240.00
Boston Woven Hose Co	186.00
A. P. Swoyer & Co	210.00
The Gutta Percha and Rubber Manufacturing Co.*	180.00

Class 6.—Continued.	
Geo. L. Neville	$209.55
The New Jersey Car Spring and Rubber Co.†	180.00
Aquila Rich	259.50
Class 7.—Ships' scrapers:	
Charles J. Field	23.00
A. P. Swoyer & Co	26.20
Geo. L. Neville	30.00
Thompson C. Gill & Co	24.50
Manhattan Supply Co	22.00
Paul J. Field, jr.*	21.95

Proposals for supplies for the navy-yard, Washington, D. C., and for the Naval Proving Ground, Indian Head, Maryland, under Bureau advertisement dated November 16, 1892; opened December 6, 1892.

Class 1.—Brick, etc.:	
J. H. Chesley & Co	$210.00
Walter F. Hewitt	Informal.
Geo. L. Neville	245.00
The Washington Brick and Terra Cotta Co.*	149.00
Niemeyer & Co	230.00
John E. Kerrill & Co	155.00
A. P. Swoyer & Co	151.00
Class 2.—Georgia pine:	
John C. Emmerson*	1,190.42
Edwin H. Gaskill	1,768.90
Thomas W. Smith	1,334.50
George L. Neville	1,195.00
Wheatly Brothers	1,328.25
Class 3.—Blocks:	
J. H. Chesley & Co.*	191.04
Ira B. White	201.00
James W. Soper	202.76
McFadden Co	216.26
Harry L. Briggs	231.20
Shubert & Cottingham	202.52
Geo. L. Neville	290.50
A. P. Swoyer & Co	213.58
W. T. & F. B. Weaver	233.58
Manhattan Supply Co	244.00
John H. Tissot	208.24
Class 4.—Rope:	
J. H. Chesley & Co	287.50
Ira B. White	280.00
Chas. H. Pleasants*	248.75
McFadden Co	272.50
S. C. Forsaith Machine Co.	278.11
Geo. L. Neville	275.00
A. P. Swoyer & Co	256.25
W. T. & F. B. Weaver	262.00
Manhattan Supply Co	272.25
Thompson C. Gill & Co	306.25
John H. Tissot	287.50
Class 5.—Coal:	
The Washington Brick and Terra Cotta Co	378.75
Niemeyer & Co.*	375.00

Class 6.—Hand grenades, etc.:	
Ira B. White	$154.70
Chas. H. Pleasants	154.78
Geo. L. Neville	314.50
Manhattan Supply Co.*	140.58
Class 7.—Fire extinguishers:	
Ira B. White	975.00
Charles H. Pleasants	737.25
Charles Millar & Son	1,050.00
McFadden Co	900.00
Manhattan Supply Co.*	710.00
Class 8.—White Pine:	
Edwin A. Gaskill	213.00
Thomas W. Smith*	170.00
Wheatly Bros	184.50
Class 9.—Hose:	
Harry L. Briggs	300.00
Boston Woven Hose Co	189.50
Geo. L. Neville	210.00
The Gutta-Percha and Rubber Manufacturing Co.*	300.00
A. P. Swoyer & Co.*	108.75
Aquila Rich	112.50
W. T. & F. B. Weaver	124.75
Manhattan Supply Co	112.50
Class 10.—Car-pushers:	
James W. Soper	21.00
McFadden Co.*†	21.00
Manhattan Supply Co	25.20
Thompson C. Gill & Co	114.00
Class 11.—Files:	
J. H. Chesley & Co	820.42
James W. Soper	643.27
The Philadelphia Machinery and Supply Co	794.09
McFadden Co	645.75
Harry L. Briggs	750.38
A. P. Swoyer & Co	708.03
W. T. & F. B. Weaver*	556.04
The Manhattan Supply Co.	830.92
Class 12.—Forgings:	
The Bethlehem Iron Co.*	564.48
Class 13.—Forgings:	
The Bethlehem Iron Co.*	168.75

* Accepted.

† Informal.

Proposals for supplies for the navy-yard, New York, under Bureau advertisement dated November 14, 1892; opened December 6, 1892.

Class 1.—Boiler tubes:	
S. C. Forsaith Machine Co.	$5,366.00
Tyler Tube and Pipe Co.*	1,902.38
Morris Tasker & Co	2,515.00
Gilchrist & Taylor	2,935.50
Class 2.—Zinc:	
Colwell Lead Co	750.00
S. C. Forsaith Machine Co.	495.00
Manhattan Supply Co	915.00
Class 3.—Candles:	
Fiske Brothers	2,930.00
Manhattan Oil Co	2,500.00
S. C. Forsaith Machine Co.*	2,490.00
Hay Walker, jr	2,592.50
Manhattan Supply Co	2,850.00
Class 4.—Iron plates:	
S. C. Forsaith Machine Co.	109.82
Donegan & Swift	97.81
Eugene L. Maxwell	85.80
Frank H. Woodruff & Co.*	78.94
Manhattan Supply Co	106.39
Thompson C. Gill & Co	94.38
Class 5.—Sheet iron:	
S. C. Forsaith Machine Co.	1,112.10
Donegan & Swift	1,173.88
Eugene L. Maxwell	1,132.70
Frank H. Woodruff & Co.*	988.53
Manhattan Supply Co	1,276.85
Thompson C. Gill & Co	1,166.80
Class 6.—Iron:	
S. C. Forsaith Machine Co.	145.42
Eugene L. Maxwell	176.39
Manhattan Supply Co	156.94
Thompson C. Gill & Co.*	134.26
Class 7.—Angle iron:	
S. C. Forsaith Machine Co.*	498.39
Eugene L. Maxwell	566.35
Frank H. Woodruff & Co.	509.71
Thompson C. Gill & Co	530.10
Class 8.—Rivets:	
J. H. Sternbergh*	156.70
Class 9.—Pipe:	
Colwell Lead Co.*†	18.90
Chas. Millar & Son	19.25
S. C. Forsaith Machine Co.	24.50
Donegan & Swift	18.90
Frank H. Woodruff & Co.	35.00
Hay Walker, jr.*	18.90
Thompson C. Gill & Co	31.43
J. H. Chesley & Co	22.40
Class 10.—Plates:	
S. C. Forsaith Machine Co.	173.29
Donegan & Swift	123.78
Frank H. Woodruff & Co.*	119.66
Manhattan Supply Co	122.95
Class 11.—Rivets:	
J. H. Sternbergh*	57.83
Manhattan Supply Co	74.53
Class 12.—Steel rods:	
Charles H. Pleasants*	13.62
Manhattan Supply Co	13.68
Thompson C. Gill & Co	14.82
Class 13.—Sheet brass:	
Colwell Lead Co	73.69
The Ansonia Brass and Copper Co	70.74

Class 13—Continued.	
Donegan & Swift	$70.74
Randolph & Clowes*	62.47
Frank H. Woodruff & Co	90.39
A. P. Swoyer & Co	74.67
Manhattan Supply Co	66.81
Thompson C. Gill & Co	117.90
J. H. Chesley & Co	78.60
Class 14.—Bronze rods:	
The Ansonia Brass and Copper Co*	54.40
Class 15.—Brass tubes:	
Colwell Lead Co	466.78
The Ansonia Brass and Copper Co	431.66
S. C. Forsaith Machine Co.	482.78
Donegan & Swift	457.60
Eugene L. Maxwell	447.12
Randolph & Clowes*	428.66
R. M. Gilmore Manufacturing Co	431.48
Frank H. Woodruff & Co.	482.58
A. P. Swoyer & Co	431.66
Manhattan Supply Co	430.04
J. H. Chesley & Co	431.23
Class 16.—Tee bars:	
S. C. Forsaith Machine Co.	19.92
Frank H. Woodruff & Co.*	17.58
Manhattan Supply Co	19.92
Thompson C. Gill & Co	23.38
Class 17.—Gauges and valves:	
Colwell Lead Co	121.92
Eugene L. Maxwell*	115.90
Manhattan Supply Co	123.60
Class 18.—Cement:	
Colwell Lead Co	78.75
Charles Millar & Son	78.75
R. M. Gilmore Manufacturing Co	68.75
A. P. Swoyer & Co.*	62.25
Manhattan Supply Co	74.50
Class 19.—Sheet iron:	
Colwell Lead Co	32.47
Charles Millar & Son	30.60
S. C. Forsaith Machine Co.	35.28
Donegan & Swift	32.40
Frank H. Woodruff & Co.	36.00
A. P. Swoyer & Co.*	30.24
Thompson C. Gill & Co	35.93
J. H. Chesley & Co	41.40
Class 20.—Hair felting:	
Eugene L. Maxwell { bid A	377.00
Eugene L. Maxwell { bid B	386.00
R. M. Gilmore Manufacturing Co	366.45
Manhattan Supply Co.*	314.60
Class 21.—Flannel lining, etc.:‡	
John H. Tissot, jr	1,452.00
Class 22.—Rubber buttons:	
John H. Tissot, jr	190.00
Thomas G. Hood	195.50
India Rubber Comb Co.*	187.50
Manhattan Supply Co	
Class 23.—Spool cotton:	
John H. Tissot, jr	92.00
Manhattan Supply Co.*	84.40

*Accepted. †By lot. ‡No award.

Proposals for flannel for the New York navy-yard, under Bureau advertisement dated November 25, 1892; opened December 13, 1892.

Class 1.—60,000 yards blue flannel, heavy:	
B. Y. Pippey & Co	$68,700.00
Wendall, Fay & Co.*	68,670.00

Proposals for supplies for the navy yard, Mare Island, California, under bureau advertisement dated November 15, 1892; opened December 13, 1892.

Class 1.—1,000 gallons beans:	
Hermann Levi*	$223.75
William Haas	290.00
Thomas H. Dowling	260.00
Sam'l J. Wormser	275.00
Class 2.—2,000 pounds rice:	
Hermann Levi*	96.00
William Hass	100.00
Thomas H. Dowling	104.00
Sam'l J. Wormser	105.00
Class 3.—500 gallons sirup:	
Hermann Levi	100.00
William Haas*	87.50
Thomas H. Dowling	96.25
Sam'l J. Wormser	95.00
Class 4.—500 gallons vinegar:	
Hermann Levi	70.00
William Haas	95.00
Thomas H. Dowling*	65.00
Sam'l J. Wormser	105.00
Class 5.—Steel plates:	
Frank H. Woodruff & Co.	*$927.00
Miller, Sloss & Scott	962.65
The Linden Steel Co.*	802.21
Carnegie Steel Co	1,069.62
Class 6.—Angles, etc.:	
Miller, Sloss & Scott*	603.30
Class 7.—Rivet Rods	
J. Sternberg	475.00
Miller, Sloss & Scott	522.50
The Linden Steel Co.*	380.00
Park Bro. & Co	427.50
Class 8.—Locomotive	
Miller, Sloss & Scott	4,274.00
H. K. Porter & Co.*	3,500.00
S. C. Forsaith M'ch'e Co.	3,945.00
Thompson C. Gill & Co	3,640.00

Proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated December 8, 1892; opened December 28, 1892.

Class 1.—Steel castings:	
Penn Steel Casting and Machine Co	$1,179.90
The Midvale Steel Co	12,261.78
Benj. Atha & Illingworth Co	12,684.60
Standard Steel Casting Co.	12,966.48
Solid Steel Co	13,036.95
Norristown Steel Co	17,617.50
Class 2.—Steel castings:	
Penn Steel Casting and Machine Co.*	8,835.75
The Midvale Steel Co	9,043.65
Benjamin Atha & Illingworth Co	9,355.50
Standard Steel Casting Co.	9,563.40
Solid Steel Co	9,615.37
Norristown Steel Co	12,993.75
Class 3.—Hardware	
J. H. Chesley & Co	239.90
Ira B. White	330.80
Harry L. Briggs*	213.52
A. P. Swoyer & Co	316.24
Geo. L. Neville	451.25
W. T. & F. B. Weaver	295.60
Class 4.—Cotton waste:	
Thompson C. Gill & Co	51.50
Manhattan Supply Co	52.00
Charles H. Pleasants*	31.48
J. H. Chesley & Co	38.75
Ira B. White	45.50
Geo. L. Neville	60.00
Charles Becker	33.00
Class 5.—Belting:	
McFadden Co	$514.70
S. C. Forsaith M'ch'e Co	364.00
Loeb Brothers*	291.25
Manhattan Supply Co	409.00
Chas. H. Pleasants	352.87
J. B. Kendall	327.00
Harry L. Briggs	344.75
A. P. Swoyer & Co	356.80
Geo. L. Neville	343.25
W. T. & F. B. Weaver	322.08
Class 6.—Steel castings:	
Penn Steel Casting and Machine Co	3,326.04
The Midvale Steel Co	4,989.06
Benj. Atha & Illingworth Co	4,157.55
Standard Steel Casting Co*	3,021.16
Solid Steel Co	3,048.87
Norristown Steel Co	4,157.55
Class 7.—Vises:	
McFadden Co	213.36
S. C. Forsaith M'ch'e Co	224.88
J. H. Chesley & Co	239.52
J. B. Kendall	244.08
Ira B. White	285.60
Harry L. Briggs *	202.08
A. P. Swoyer & Co	224.16
Geo. L. Neville	480.00
W. T. & F. B. Weaver†	156.00
Class 8.—Forged steel:	
S. C. Forsaith M'ch'e Co	2,789.45
Carpenter Steel Co	2,967.50

*Accepted.

† Withdrawn.

Proposals for supplies for the navy-yard, Washington, D. C., etc.—Continued.

Class 8.—Continued.	
The Midvale Steel Co.	$1,780.50
Benj. Atha & Illingworth Co.	1,543.10
J. B. Kendall	2,077.25
Park, Bro. & Co	2,967.50
Geo. L. Neville	2,967.50
Cumberland Steel and Tin Plate Co	2,314.65
Class 9.—Oak timber:	
W. C. Cooke	2,834.40
Chas. S. Conner	3,252.59
J. B. Kendall	2,984.40
Charles Esté	3,313.38
Edwin A. Gaskill	2,729.28
John C. Emmerson	3,733.96
Geo. L. Neville	3,307.25
D. C. Alexander	3,086.40
W. T. & F. B. Weaver*	2,284.62
Class 10.—Tools:	
Ira B. White	110.10
Harry L. Briggs	70.33
W. T. & F. B. Weaver*	69.28
Class 11.—Files:	
McFadden Co.*	98.75
A. P. Swoyer & Co	111.16
W. T. & F. B. Weaver	130.74
Class 12.—Lumber:	
Edwin A. Gaskill*	58.90
D. C. Alexander†	———
Class 13.—Window glass:	
Charles H. Pleasants*	170.16
A. P. Swoyer & Co	173.40
Geo. L. Neville	207.20
Daniel Shannahan	180.80
Charles Becker	182.16
Class 14.—Paints:	
Aquila Rich	52.12
Charles H. Pleasants*	49.82
Ira B. White	70.25
Chas. M. Childs & Co	52.84
Geo. L. Neville	87.50
Daniel Shannahan	101.50
Charles Becker	62.00
Class 15.—Electrical supplies:	
Thompson C. Gill & Co.*	$46.75
Chas. H. Pleasants	54.70
Ira B. White	78.50
Geo. L. Neville	82.00
Class 16.—Cross-ties:	
Thompson C. Gill & Co	247.50
Chas S. Conner	200.00
J. B. Kendall	187.50
Geo. L. Neville	312.50
D. C. Alexander	170.00
W. T. & F. B. Weaver*	125.00
Class 17.—Globes:	
Thompson C. Gill & Co.	30.50
Chas H. Pleasants*	12.50
J. H. Chesley & Co	15.00
Ira B. White	39.00
Geo. L. Neville	46.00
Class 18.—Rope:	
McFadden Co	36.63
Thompson C. Gill & Co	38.30
Chas. H. Pleasants*	34.12
A. P. Swoyer & Co	48.46
Geo. L. Neville	39.96
W. T. & F. B. Weaver	34.96
Class 19.—Cocks, etc.:	
Thompson C. Gill & Co	34.50
H. P. Swoyer & Co.*	25.05
Class 20.—Cement, etc.:	
Walter F. Hewitt*	48.25
Chas. H. Pleasants	126.75
Cammack & Decker	54.55
Geo. L. Neville	60.50
Daniel Shannahan	55.25
Class 21.—Wire gauze:	
S. C. Forsaith Machine Co.	34.82
Thompson C. Gill & Co	36.48
J. H. Chesley & Co	34.83
Ira B. White	91.65
John C. Emmerson	30.63
Geo. L. Neville	30.24
W. T. & F. B. Weaver*	27.49

Proposals for supplies for the New York navy-yard, under Bureau advertisement dated December 9, 1892; opened December 28, 1892.

Class 1.—1,000 prs. marching shoes:	
Hans Hemken	$2,570.00
Geo. F. Roedel	2,600.00
The Watsontown Boot and Shoe Co.*	2,310.00
Class 2.—24.500 pounds flour:	
Francis H. Leggett & Co	506.66
Manhattan Supply Co	517.44
Chas. T. Goodwin Son*	501.50
John J. O. Rorke	516.95
Rowland & Co	504.69
Chas. E. Ahrens	502.25
Class 3.—2,000 scrub brushes:	
J. B Morrell & Co.*	319.60
Manhattan Supply Co	378.00
Joseph Wechsler	400.00
Class 4.—2,000 blacking brushes:	
J. B. Morrell & Co	$440.00
Manhattan Supply Co.*	414.00
Joseph Wechsler	500.00
Class 5.—2,000 wisp brooms:	
J. H. Chesley & Co	364.00
J. B. Morrell & Co	325.00
Manhattan Supply Co.*	280.00
Joseph Wechsler	400.00
Class 6.—5,000 spools cotton waste:	
William Wilson*	159.38
Manhattan Supply Co	170.00
Joseph Wechsler	168.75

* Accepted.

† Informal.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 7.—3,000 dozen rubber buttons (small):	
India Rubber Comb Co.*..	$109.50
Frank H. Woodruff & Co..	132.00
Joseph Wechsler	112.50
Class 8.—2,000 coarse combs:	
Joseph Wechsler*	95.00
Class 9.—Dry goods	
Manhattan Supply Co.*...	575.52
Class 10.—Flange steel:	
S. C. Forsaith Machine Co.	168.66
Manhattan Supply Co.....	168.66
Hans Hemken	214.19
Thompson C Gill & Co...	208.01
Frank H. Woodruff & Co.*	157.37
Class 11.—Bloom iron:	
J. H. Chesley & Co	171.16
S. C. Forsaith Machine Co.	212.25
Manhattan Supply Co.....	187.41
Donegan & Swift	159.20
Frank H. Woodruff & Co.	135.48
Class 12.—Sheet brass	
Manhattan Supply Co....	203.40
Donegan & Swift*	138.83
Class 13.—Angle iron:	
Manhattan Supply Co.....	94.77
Donegan & Swift	87.28
Thompson C Gill & Co.*..	69.29
Frank H Woodruff & Co.	94.77
Class 14.—Angle steel.	
Manhattan Supply Co.*..	8.31
Donegan & Swift.........	16.67
Hans Hemken	11.98
Thompson C. Gill & Co. ..	8.77
Frank H Woodruff & Co.	11.08
Class 15.—Machinery steel:	
S. C. Forsaith Machine Co.*	85.70
Manhattan Supply Co.....	99.23
Donegan & Swift........	101.00
Hans Hemken............	88.66
Benj. Atha & Illingworth Co	92.99
The Midvale Steel Co.....	92.49
Thompson C. Gill & Co...	93.08
Carpenter Steel Co.......	141.15
Class 16.—Seamless drawn copper tube:	
S. C. Forsaith Machine Co	72.82
Colwell Lead Co	73.86
Manhattan Supply Co....	71.10
Donegan & Swift*.......	69.37
Hans Hemken	100.26
Class 17.—Pipe, etc.	
S. C. Forsaith Machine Co	169.47
Manhattan Supply Co. *..	161.08
Donegan & Swift.........	188.23
Manning, Maxwell & Moore..................	224.36
Class 18.—Gauges:	
S. C. Forsaith Machine Co	183.60
Harry L. Briggs..........	176.20
Crosby, Steam Gauge & Valve Co................	163.20
Colwell Lead Co.........	184.50
Manhattan Supply Co.*..	15.20
Donegan & Swift.........	171.60
Manning, Maxwell & Moore.................	200.00
Class 19.—Nuts and rivets:	
Manhattan Supply Co....	$216.27
J. H. Sternbergh & Son*..	209.68
Class 20.—Whistles:	
S. C Forsaith Machine Co.	34.00
Harry L. Briggs .	42.40
Crosby Steam Gauge and Valve Co .... bid A...	42.00
Crosby Steam Gauge and Valve Co .... bid B†..	30.00
Colwell Lead Co..........	43.12
Donegan & Swift........	43.20
Manning, Maxwell & Moore*.................	33.60
Class 21.—Asbestus board:	
Harry L. Briggs..........	83.75
Chas. H. Pleasants.......	83.83
Manhattan Supply Co.*...	81.00
Donegan & Swift.........	90.00
Aquila Rich..............	92.75
Class 22.—Tube-expanders:	
Henry L. Briggs..........	120.00
Manhattan Supply Co....	178.40
Manning, Maxwell & Moore	160.00
Class 23.—Hand lathe:	
S.C. Forsaith Machine Co.*	174.00
Manhattan Supply Co.....	355.00
Class 24.—Drill press:	
Manhattan Supply Co.*...	670.00
Class 25.—Chasers:	
Manhattan Supply Co.*..	495.00
Class 26.—Milling machine:	
Manhattan Supply Co.*...	598.00
Class 27.—Screw-cutter engine lathe:	
S. C. Forsaith Machine Co.*	640.00
Manhattan Supply Co.. ..	775.00
Class 28.—5,000 jackknives:	
Manhattan Supply Co.....	1,996.50
W. F. Rockwell	2,250.00
Ansel W. Paine*..........	1,985.00
Class 29.—Hardware:	
Harry L. Briggs*.........	48.21
Manhattan Supply Co....	60.30
Class 30.—Manila rope:	
Harry L. Briggs..........	32.70
Charles H Pleasants.....	23.00
Manhattan Supply Co.....	28.10
Thompson C. Gill & Co...	34.00
Class 31.—Fire bricks:	
Chas. H. Pleasants	18.84
Manhattan Supply Co	36.44
Class 32.—Sheet brass:	
Harry L. Briggs..........	10.50
Manhattan Supply Co.*...	9.70
Donegan & Swift.........	12.50
Thompson C. Gill & Co..	12.90
Class 33.—Packing, etc.	
Manhattan Supply Co.....	284.50
The New Jersey Car Spring and Rubber Co.*........	164.26
Imperial Rubber Co	212.00
Class 34.—Polishing paste, etc.:	
Chas. H. Pleasants	10.87
J B. Morrell & Co	14.75
Manhattan Supply Co.....	12.37
Chas. M. Childs & Co.....	15.00
Aquila Rich*..............	10.65

*Accepted.

†Informal.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 35.—Packing:	
S. C. Forsaith Machine Co.	$144.50
Harry L. Briggs	130.75
Manhattan Supply Co.*	115.50
Donegan & Swift	134.40
Aquila Rich	135.00
Class 36.—Cotton waste, etc.:	
Harry L. Briggs*	84.15
Chas. H. Pleasants	109.35
Manhattan Supply Co	128.20
Class 37.—Blocks and sheaves:	
Manhattan Supply Co	57.00
Manning, Maxwell & Moore*	53.20
Class 38.—Hardware:	
Harry L. Briggs*	219.85
Manhattan Supply Co	224.02
Class 39.—Lamps, etc.:	
William Porter's Sons	109.26
Harry L. Briggs*	103.44
Manhattan Supply Co	106.20
Porter's Son & Manning	104.40
Class 40.—Tools:	
Harry L. Briggs	1,342.80
Manhattan Supply Co	1,389.09
Manning, Maxwell & Moore*	1,338,20
Class 41.—Steel boiler:	
Donegan & Swift	12.08
Thompson C. Gill & Co	12.08
Frank H. Woodruff & Co.*	9.06
Class 42.—Antiattrition metal:	
Charles H. Pleasants †	364.04
Manhattan Supply Co.*	401.00
Class 43.—Zinc:	
S. C. Forsaith Machine Co.	223.12
Colwell Lead Co.*	150.00
Manhattan Supply Co	240.00
Donegan & Swift	240.00
Class 44.—Thermometers, etc.:	
Manhattan Supply Co	65.20
Manning, Maxwell & Moore*	58.93
Class 45.—Rubber tubing, etc.:	
Manhattan Supply Co	57.50
The Boston Woven Hose and Rubber Co.*	31.65
The New Jersey Car Spring and Rubber Co	38.45
Imperial Rubber Co	54.50
Aquila Rich	68.35
Class 46.—Hose:	
Revere Rubber Co	$568.00
S. C. Forsaith Machine Co.	641.75
Gutta Percha and Rubber Manufacturing Co.	464.00
Manhattan Supply Co	517.00
The Boston Woven Hose and Rubber Co	474.00
The New Jersey Car Spring and Rubber Co	630.56
Imperial Rubber Co	492.50
Aquila Rich	506.77
Class 47.—Paints, etc.:	
Charles H. Pleasants	145.46
Manhattan Supply Co	158.64
Charles M. Childs & Co.*	131.88
Aquila Rich	135.67
Class 48.—Gaskets, etc.:	
Manhattan Supply Co	106.98
The New Jersey Car Spring and Rubber Co	59.46
Imperial Rubber Co	55.30
Class 49.—Indicator springs:	
Manning, Maxwell & Moore	144.00
Class 50.—Nails, etc.:	
J. H. Chesley & Co	37.00
Harry L. Briggs*	31.32
Charles H. Pleasants	35.19
Manhattan Supply Co	35.50
Class 51.—White pine:	
Watson & Pittinger*	490.00
Chas. E. Pell	500.00
Class 52—Hardware:	
Harry L. Briggs*	126.08
Charles H. Pleasants	152.79
Manhattan Supply Co	140.50
Class 53.—Boat knees:	
Watson & Pittinger*	80.00
Chas. E. Pell	87.50
Class 54.—Steam pipings	26.96
Colwell Lead Co.*	18.76
Manhattan Supply Co	35.20
Donegan & Swift	27.68
Thompson C. Gill & Co	42.00
Frank H. Woodruff & Co.	27.68
Class 55.—Oars:	
Chas. H. Pleasants*	50.68
J. B. Morrell & Co	52.50

Proposals for supplies for the navy-yard, League Island, Pennsylvania, under Bureau advertisement dated December 16, 1892; opened January 3, 1893.

Class 1.—Capstans:		
S. C. Forsaith Machine Co.	bid A.	$500.00
	bid B.	620.00
The American Ship Windlass Co.		330.00
A. P. Swoyer & Co.*		316.30
Class 2.—Yellow pine:		
Edwin A. Gaskill*		26.00
George L. Neville		60.00
Class 3.—Pipe, etc.:		
Thompson C. Gill & Co		$697.95
A. P. Swoyer & Co*		705.36
Ford & Kendig Co		627.00
E. T. Tweedy*		606.76
George L. Neville		746.90

*Accepted.

†Withdrawn.

Proposals for supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated December 17, 1892; opened January 3, 1893.

Class 1.—150 tons anthracite coal:	
David Duncan & Son	$975.00
J. Albert Walker*	840.00
Class 2.—100 tons bituminous coal:	
David Duncan & Son	570.00
J. Albert Walker*	518.00
Class 3.—80,000 bricks:	
John H. Broughton *	756.00
S. C. Forsaith Machine Co.	852.00
Class 4.—Lime, etc.:	
John H. Broughton *	280.00
Class 5.—Granite window sills:	
John H. Broughton *	96.50
Class 6.—Roof trusses:	
S. C. Forsaith Machine Co.*	$521.00
Thompson C. Gill & Co.	622.91
Class 8.—Spruce, etc.:	
John H. Broughton	457.31
S. C. Forsaith Machine Co.*	400.30
Class 9.—Window frames:	
S. C. Forsaith Machine Co.*	191.75
Class 10.—Roofing slate:	
John H. Broughton*	268.50
S. C. Forsaith Machine Co.*	268.50
Thompson C. Gill & Co.	269.70
Class 11.—Roofing tin:	
S. C. Forsaith Machine Co.	45.00
Thompson C. Gill & Co.	41.36
Charles H. Pleasants*	39.60

Proposals for supplies for navy-yard, Norfolk, Va., under Bureau advertisement dated December 15, 1892; opened January 3, 1893.

Class 1.—Safe:	
Charles H. Pleasants	$694.49
S. C. Forsaith Machine Co.	908.00
Class 2.—Nails:	
Charles H. Pleasants	34.80
Manhattan Supply Co.	35.50
Thompson C. Gill & Co.	31.65
George L. Neville*	31.05
Ira B. White	32.10
Class 3.—Pine:	
A. A. McCullough	506.60
Edwin A. Gaskill	681.91
George L. Neville*	371.95
John C. Emmerson	413.28
Class 4.—Steel cut nails:	
Charles H. Pleasants	36.00
Manhattan Supply Co.	34.50
Thompson C. Gill & Co.	33.45
George L. Neville*	32.25
Ira B. White	33.00
Class 5.—Yellow pine:†	
A. A. McCullough	$1,594.65
Edwin A. Gaskill	1,887.44
George L. Neville	1,657.15
John C. Emmerson	1,624.00
Class 6.—Flax canvas:	
Charles H. Pleasants*	74.51
J. B. Morrell & Co.	88.80
Class 7.—Cotton canvas, etc.:	
George L. Neville	1,053.21
J. B. Morrell & Co.*	824.62
Class 8.—Cotton line, etc.:	
Chas. H. Pleasants	93.60
Manhattan Supply Co.*	76.16
George L. Neville	101.44
Ira B. White	97.75
Class 9.—Iron rings:	
Chas. H. Pleasants	28.50
Manhattan Supply Co.	30.68
Geo. L. Neville*	27.94
Ira B. White	33.20

Proposals for supplies for navy-yard, Washington, D. C., and for the Naval Proving Grounds, Indian Head, Maryland, under Bureau advertisement dated December 14, 1892; opened January 3, 1893.

Class 1.—Steam pipe, etc.:	
Manhattan Supply Co.	$522.51
S. C. Forsaith Machine Co.	520.56
Chas. Miller & Son.	504.47
Robt. Leitch & Sons	486.00
McFadden Co	521.32
J. H. Chesley & Co	567.10
Cook, Horner & Co	623.55
A. P. Swoyer & Co.*	463.66
E. J. Tweedy	482.08
Geo. L. Neville	556.50
Class 2.—Tools:	
Manhattan Supply Co.	7.10
Harry L. Briggs	7.40
McFadden Co.	7.01
J. H. Chesley & Co	11.15
A. P. Swoyer & Co.*	6.24
Class 3.—Hose:	
S. C. Forsaith Machine Co.	$58.00
Harry L. Briggs	36.00
Gutta-Percha and Rubber Manufacturing Co.	54.00
N. J. Car Spring and Rubber Co	27.00
Page Belting Co	32.00
Henry J. M. Howard	30.00
McFadden Co	35.64
A. P. Swoyer & Co	28.00
Aquila Rich*	23.98
The Boston Woven Hose and Rubber Co	30.50
Geo. L. Neville	70.00
Class 4.—Packing:	
Harry L. Briggs	142.98
Henry J. M. Howard	192.38

* Accepted.

† No award.

Proposals for supplies for navy-yard, Washington, D. C., etc.—Continued.

Class 4.—Continued.	
The Crandell Packing Co.	$162.13
Aquila Rich	164.32
The Boston Woven Hose and Rubber Co*	138.30
Class 5.—Steel plates:†	
Class 6.—72,000 brick:	
Niemeyer & Co	1,069.20
S. S. Daish*	856.80
Class 7.—Cement, etc.:	
Niemeyer & Co	192.40
Hans Hemsken	209.56
Clark Bros	172.00
Daniel Shanahan	137.80
Walter F. Hewitt*	126.32
J. T. Walker's Sons	142.20
Cammack & Decker	148.80
Geo. L. Neville	159.00
Class 8.—Window frames:	
Geo. L. Neville*	$378.00
Class 9.—Hardware:	
J. H. Chesley & Co	87.01
Geo. L. Neville	129.30
Class 10.—Georgia pine:	
Edwin A. Gaskill*	385.00
Class 11.—White pine:	
Edwin A. Gaskill*	178.26
Class 12.—Tin, etc.:	
Thompson C. Gill & Co	253.74
J. T. Walker's Sons	361.52
J. H. Chesley & Co	185.33
A. P. Swoyer & Co.*	173.38
Chas. H. Pleasants	223.02
Geo. L. Neville	330.95

Proposals for supplies for the navy-yard, New York, under Bureau advertisement dated December 13, 1892; opened January 3, 1893.

Class 1.—Trimmings:	
Joseph Wechsler*	$1,165.00
Class 2.—5,000 yards trousers cloth:	
B. Y. Pippey & Co	12,700.00
Class 3.—5,000 gallons beans:	
Manhattan Supply Co	1,620.00
J. J. O'Rorke	1,634.50
Chas. E. Ahrens	1,585.00
Kemp, Day & Co	1,875.00
Francis H. Leggett & Co.*	1,576.50
Class 4.—20,000 pounds rice:	
J. J. O'Rorke	990.00
Chas. E. Ahrens	994.00
Gustave A. Jahn	1,050.00
Francis H. Leggett & Co.*	986.00
Class 5.—5,000 pounds apples:	
Manhattan Supply Co	680.00
J. J. O'Rorke*	508.50
Chas. E. Ahrens	535.00
Class 6.—1,000 pounds prunes:	
J. J. O'Rorke	167.70
Chas. E. Ahrens*	159.00
Francis H. Leggett & Co	170.00
Class 7.—2,000 pounds cocoa:	
Kemp, Day & Co.*	629.00
Class 8.—300 tons coal:	
David Duncan & Son	1,332.00
Barber & Zeigler	1,302.00
Class 8—Continued.	
Samuel G. French*	$1,299.00
David S. Wells	1,347.00
Class 9.—Taps, etc.:	
Manhattan Supply Co	210.50
Harry L. Briggs	200.72
McFadden Co.*	187.54
Henry S. Manning	199.94
Class 11.—Pig iron:	
Henry S. Manning*	254.00
Thompson C. Gill & Co	291.00
Class 12.—Belting:	
Manhattan Supply Co	533.60
Loeb Bros.*	373.50
S. C. Forsaith Machine Co.	472.15
Page Belting Co	456.85
Henry S. Manning	479.25
Chas. H. Pleasants	482.25
The Grattan & Knight Manufacturing Co	384.20
Class 13.—Rope:	
Manhattan Supply Co*	366.26
S. C. Forsaith Machine Co.	376.54
Hans Hemken	458.75
Chas. H. Pleasants	369.77
Class 14.—Blocks:	
Manhattan Supply Co	130.48
Chas. A. Jones*	84.92
Henry S. Manning	93.10

Proposals for supplies for the navy-yard, Mare Island, California, under Bureau advertisement dated December 19, 1892; opened January 10, 1893.

Class 1.—Lubricating oil:	
William F. Whittier*	$217.50
Class 2.—Cylinder oil:	
William F. Whittier*	51.00
Class 3.—White lead:	
Chas. M. Childs & Co	492.00
William F. Whittier*	430.50
Chas. M. Yates	438.15
Thompson C. Gill & Co	516.58
Class 4.—Paints:	
Charles M. Childs & Co	$400.01
William F. Whittier*	374.61
Chas. M. Yates	380.78
Aquila Rich	400.60
Class 5.—Pipe, etc.:	
Crane Co	2,382.37
Holbrook, Merrill & Stetson	2,405.18

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*Accepted.

†Open purchase.

Proposals for supplies for the navy-yard, Mare Island, California, etc.—**Continued.**

Class 5—Continued.	
Geo. H. Fay Co	$2,570.69
Miller, Sloss & Scott	2,508.28
Dunham, Carrigan & Hayden Co.*	2,354.83
Class 6.—Wash trays:	
Holbrook, Merrill & Stetson*	139.50
Geo. H. Fay Co	147.15
Class 7.—Brushes:	
G. B. Richart	27.50
Miller, Sloss & Scott*	22.00
Class 8.—Horse furnishings:	
G. B. Richart*	40.50
Miller, Sloss & Scott	66.00
Class 9.—Soap:	
G. B. Richart	51.50
Miller, Sloss & Scott*	50.50
Class 10.—Lumber:	
William Walker	$973.13
The Union Lumber Co	932.07
Abraham Powell	948.39
J. F. Kennedy	1,115.26
A. S. Carman*	923.38
Class 11.—Cement:	
William Walker	333.72
Abraham Powell*	265.74
A. S. Carman	270.89

Class 12.—Sand:	
William Walker	$80.00
Abraham Powell	64.00
A. S. Carman*	60.00
Class 13.—Radiators:	
Crane Co.†	126.67
Miller, Sloss & Scott	204.20
S.C. Forsaith Machine Co.*	161.01
Class 14.—Iron:	
Holbrook, Merrill & Stetson*	70.68
Geo. H. Fay Co	72.92
Miller, Sloss & Scott	84.04
S. C. Forsaith Machine Co.	98.59
Thompson C. Gill & Co	85.71
Class 15.—Terra-cotta pipe:	
N. Clark & Sons	350.00
Gladding, McBean & Co.*	336.00
Class 16.—Hardware:	
Miller, Sloss & Scott	133.95
Dunham, Carrigan & Hayden Co.*	112.03
Class 17.—Redwood shingles:	
William Walker	83.30
The Union Lumber Co.*	74.80
Abraham Powell	84.66
A. S. Carman	81.60

Proposals for supplies for the navy-yard, Washington, D. C., under the Bureau advertisement dated December 30, 1892; opened January 17, 1893.

Class 1.—8,000 pieces poplar lumber:	
Edwin A. Gaskill*	$9,370.00
S. C. Forsaith, Machine Co.	12,800.00
John C. Emmerson	11,500.00
Class 2.—200 sheepskins:	
Eugene L. Maxwell*	348.00
Manhattan Supply Co.	794.00
Geo. L. Neville	698.00
Class 3.—50 sides sole leather:	
Bearnard J. Isemann	475.00
Eugene L. Maxwell	419.00
B. Frank & Sons*	362.38
Chas. S. Walton	365.00
Manhattan Supply Co	399.00
Stevenson Bros. & Co	625.00

Class 3.—Continued.	
S. C. Forsaith Machine Co.	$447.50
Geo. L. Neville	550.00
Class 4.—2,900 lbs. steel forgings:	
The Bethlehem Iron Co.*.	1,131.00
Class 5.—300 gals. glycerine:	
Eugene L. Maxwell	471.00
Fiske Bros	448.50
Aquila Rich	441.99
Chas. M. Childs & Co	441.00
Manhattan Supply Co	585.00
Stevenson Bro. & Co	525.00
Shoemaker & Busch	446.63
Geo. L. Neville	450.00
Chas. H. Pleasants*	389.97

Proposals for supplies for navy-yard, New York, under Bureau advertisement dated December 29, 1892; opened January 17, 1893.

Class 1.—10,000 yds. cap cloth:	
Wendell, Fay & Co	$18,300.00
Sullivan, Vail & Co	19,720.00
B. Y. Pippey & Co	22,400.00
Class 2.—20,000 pairs woolen socks:	
Thos. G. Hood*	5,400.00
Roger Lamson	7,000.00
B. Y. Pippey & Co	6,200.00
Calss 3.—25,000 yards unbleached duck:	
J. B. Morrell & Co.*	2,666.25
Roger Lamson	2,725.00
Manhattan Supply Co	2,732.50

Class 4.—Dry goods trimmings:	
Roger Lamson*	$606.75
Manhattan Supply Co	748.20
B. Y. Pippey & Co	632.99
Class 5.—Spool cotton:	
Abraham Abraham	598.00
Roger Lamson	596.40
Manhattan Supply Co.*	592.00
William Wilson	612.06
Hans Hemken	671.32
Class 6.—Sewing silk, etc:	
Abraham Abraham	531.00
The Heminway & Bartlett Silk Co.*	491.00

* Accepted.

† Informal.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 6—Continued.	
Roger Lamson	$564.84
The Richardson Silk Co	506.93
Hans Hemken	547.94
Class 7.—Braid and laces:	
Roger Lamson*	156.99
Hans Hemken	178.30
Class 8.—Buttons, eagle, etc.:	
Thos. G. Hood*	90.00
D. Evans & Co	141.67
Hans Hemken	303.00
Class 9.—Buttons, rubber:	
Abraham Abraham	437.50
Thomas G. Hood	380.00
Roger Lamson*	367.50
The India Rubber Comb Co	370.00
Manhattan Supply Co	395.00
Hans Hemken	371.69
Class 10.—Buttons, bone:	
Abraham Abraham*	34.00
Roger Lamson	48.00
The Manhattan Supply Co.	48.00
Geo. L. Neville	43.76
Class 11.—Cap leathers:	
Oliver Bros*	$171.50
Roger Lamson	177.12
Class 12.—Steel bars:	
Frank H. Woodruff & Co.	1,331.80
Manhattan Supply Co	2,179.87
The Midvale Steel Co	1,526.98
The Carnegie Steel Co	1,199.77
Hans Hemken*	1,015.75
Geo. L. Neville	4,362.80
Thompson C. Gill & Co	1,958.13
Class 13.—Soft rolled copper:	
J. H. Chesley & Co	599.06
Park, Brother & Co.*	582.70
The Ansonia Brass and Copper Co	583.11
Frank H. Woodruff & Co.	650.63
Aquila Rich	621.98
Geo. L. Neville	583.11
J. Fredenstein	599.48
Class 14.—4 hoisting winches:	
The Phœnix Iron Co	4,000.00
The American Ship Windlass Co	5,900.00
S. C. Forsaith Machine Co.*	2,972.00

Proposals for supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated January 10, 1893; opened January 31, 1893.

Class 1.—Galvanized iron, etc.:	
J. H. Chesley & Co	$419.09
Charles H. Pleasants*	378.08
Ira B. White	661.30
S. C. Forsaith Machine Co.	417.82
A. P. Swoyer & Co	418.01
Aquila Rich	2,728.50
Geo. L. Neville	383.15
Class 2.—Rivets, etc.:	
J. H. Chesley & Co.*	44.50
Ira B. White	80.00
S. C. Forsaith Machine Co.	125.63
Aquila Rich	87.50
Geo. L. Neville	53.50
Class 3.—Iron sash frames:	
Geo. L. Neville*	350.00
Class 4.—Yellow pine:	
A. A. McCullough	2,351.44
Edwin A. Gaskill	2,197.73
Geo. L. Neville*	1,959.52
John C. Emmerson, informal.	
Class 5.—Felt roofing, etc.:	
S. W. Niemeyer & Co	228.00
The National Building Supply Co	238.50
Chas. H. Pleasants	311.61
McFadden Co	220.95
S. C. Forsaith Machine Co.	355.50
The Norfolk Supply Co	210.00
Geo. L. Neville*	208.50
Class 6.—Wire:	
The Western Electric Co.*	852.25
Geo. L. Neville	1,856.50
Class 7.—Electrical supplies:	
The Western Electric Co	4,383.23
Class 7—Continued.	
Ira B. White	$4,648.20
The Arnold Electric M'f'g Co	4,352.57
The General Electric Co.*	3,576.44
Geo. L. Neville	7,822.55
Class 8.—Electrical supplies:	
The Western Electric Co	1,930.75
The International Trading and Electric Co.*	1,794.10
The General Electric Co	2,133.48
Class 9.—Electrical supplies:	
The General Electric Co.*	1,300.00
Geo. L. Neville †	25.00
Class 10.—Screws:	
J. H. Chesley & Co	61.07
Harry L. Briggs*	59.10
Ira B. White	78.44
The Arnold Electric M'f'g Co	111.81
Geo. L. Neville	98.23
Class 11.—Motor, etc.:	
Chas. H. Pleasants*	194.25
Ira B. White	208.00
The Arnold Electric M'f'g Co	216.00
The General Electric Co	330.00
Class 12.—White lead, etc.:	
Daniel Shannahan	76.00
Chas. H. Pleasants	72.36
Ira B. White	71.20
Smith, Kline & French Co.*	68.04
The Norfolk Supply Co	79.04
Chas. M. Childs & Co	69.60
Aquila Rich	73.20
Geo. L. Neville	76.00

* Accepted.

† Withdrawn.

Proposals for supplies for the New York navy-yard, under Bureau advertisement dated January 11, 1893; opened January 31, 1893.

Class 1.—Brushes, etc.:	
J. B. Morrell & Co	$766.95
Chas. H. Pleasants	781.37
Manhattan Supply Co	703.74
Aquila Rich*	458.19
Harry L. Briggs	747.05
Oliver Brothers	616.87
Class 2.—Files:	
Ansel W. Paine	40.76
Manhattan Supply Co	30.33
Harry L. Briggs*	27.50
Oliver Brothers	33.94
Class 3.—Candles:	
J. B. Morrell & Co	57.60
Chas. H. Pleasants	38.94
Manhattan Supply Co	44.40
Aquila Rich	58.80
Harry L. Briggs*	37.80
Class 4.—Sponges, etc.:	
J. B. Morrell & Co	47.00
Chas. H. Pleasants	54.09
Manhattan Supply Co	51.00
Aquila Rich	60.00
Harry L. Briggs*	40.25
Class 5.—10,000 pounds white lead:	
Chas. H. Pleasants	674.00
Chas. M. Childs & Co	620.00
Aquila Rich*	612.50
Smith, Kline & French Co.	615.00
Oliver Brothers	689.00
McDonagh & Co	634.00
Class 6.—8,000 pounds zinc:	
J. B. Morrell & Co	496.00
Class 6—Continued.	
Chas. M. Childs & Co	$459.20
Aquila Rich*	447.60
Smith, Kline & French Co.	510.00
McDonagh & Co	460.00
Class 7.—Linseed oil:	
J. B. Morrell & Co	360.00
Chas. K. Pleasants	386.25
Chas. M. Childs & Co	350.62
Aquila Rich	352.50
Smith, Kline & French Co.	345.00
Oliver Brothers	360.00
Class 8.—Turpentine:	
J. B. Morrell & Co	108.00
Chas. H. Pleasants	127.50
Chas. M. Childs & Co	105.75
Aquila Rich	110.63
Smith, Kline & French Co.*	99.00
McDonagh & Co	108.00
Class 9.—Varnish:	
Chas. H. Pleasants	490.89
Chas. M. Childs & Co	424.50
Aquila Rich*	388.62
Smith, Kline & French Co.	446.20
McDonagh & Co	388.85
Class 10.—Alcohol:	
Aquila Rich*	191.20
Class 11.—Cheese cloth:	
J. B. Morrell & Co.*	21.25
Manhattan Supply Co	41.65
J. W. Bond & Co. bid A bid B	38.25 23.38
Aquila Rich	68.00
Harry L. Briggs	27.20

Proposals for supplies for the navy-yard, Washington, D. C., and the Naval Proving Ground, Indian Head, Maryland, under Bureau advertisement dated January 12, 1893; opened January 31, 1893.

Class 1.—Tool steel:	
Crescent Steel Co	$1,605.75
Carpenter Steel Co	1,388.50
Manhattan Supply Co	1,668.40
Sanderson Bros. Steel Co.	1,466.00
Wm. J. Haines & Co	2,285.00
J. B. Kendall*	1,225.50
Class 2.—Calipers:	
J. H. Chesley & Co	89.25
Chas. H. Pleasants	103.62
Francis H. Sullivan	92.50
Ansel W. Paine	106.25
Eugene L. Maxwell	90.00
Manhattan Supply Co.*	80.75
A. P. Swoyer & Co	101.25
J. B. Morrell & Co	118.75
Harry L. Briggs	115.75
George L. Neville	92.75
The Philadelphia Machinery and Supply Co	90.00
McFadden Co	87.00
J. B. Kendall	102.50
Class 3.—Water cans and buckets:	
J. H. Chesley & Co	558.00
Manhattan Supply Co	645.00
George L. Neville*	525.00
Class 4.—Tools:	
S. C. Forsaith Machine Co.	$571.00
Eugene L. Maxwell	587.50
Manhattan Supply Co	639.00
The Philadelphia Machinery and Supply Co	595.42
McFadden Co.*	566.58
Class 5.—Hardware:	
J. H. Chesley & Co.*	65.96
Manhattan Supply Co	82.49
Harry L. Briggs	82.25
Geo. L. Neville	147.00
W. A. Pate	80.13
Class 6.—Thread:	
Manhattan Supply Co	37.60
Geo. L. Neville.*	12.00
Class 7.—White pine:	
S. C. Forsaith Machine Co.*	2,033.00
Geo. L. Neville	2,540.00
Edwin A. Gaskill	2,058.00
Class 8.—Poplar:	
Edwin A. Gaskill*	1,877.50
Class 9.—Georgia pine:	
W. T. & F. B. Weaver	210.00
Geo. L. Neville	200.00
Edwin A. Gaskill*	165.00

*Accepted.

Proposals for supplies for the navy-yard, Washington, D. C., etc.—Continued.

Class 10.—Files:	
J. H. Chesley & Co	$44.41
W. T. & F. B. Weaver	43.79
Ansel W. Paine	55.87
Eugene L. Maxwell	41.87
Manhattan Supply Co	42.94
A. P. Swoyer & Co	42.78
Harry L. Briggs	45.17
W. A. Pate	58.26
McFadden Co. *	40.00
Class 11.—Bolts and nuts:	
J. H. Chesley & Co	19.37
W. T. & F. B. Weaver *	15.92
Manhattan Supply Co	20.72
Harry L. Briggs	27.22
Geo. L. Neville	42.50
W. A. Pate	26.53
Class 12.—Hardware:	
J. H. Chesley & Co	98.69
W. T. & F. B. Weaver *	85.53
Manhattan Supply Co	94.02
Harry L. Briggs	90.57
Geo. L. Neville	190.90
W. A. Pate	104.07
Class 13.—Cotton canvas: †	
Chas. H. Pleasants	58.20
W. T. & F. B. Weaver	55.20
J. B. Morrell & Co	51.84
Geo. L. Neville	96.00
W. A. Pate	57.60
The Philadelphia Machinery and Supply Co	52.50
Class 14.—White ash and stove coal:	
S. W. Niemeyer	690.75
Geo. L. Neville	636.65
Class 15.—Glass:	
Charles H. Pleasants	56.20
Daniel Shannahan *	55.20
Charles Becker	62.70
George Ryneal, jr	61.00
Aquila Rich	171.00
Manhattan Supply Co	82.00
George L. Neville	176.00
W. A. Pate	76.00
Hugh Reiley	57.00
Class 16.—Brass rod:	
J. H. Chesley & Co	67.51
Charles H. Pleasants	62.15
W. T. & F. B. Weaver	67.20
Aquila Rich	63.20
Manhattan Supply Co	62.00
A. P. Swoyer & Co.*	61.82
Harry L. Briggs	62.25
George L. Neville	191.00
W. A. Pate	72.10
Class 17.—Soft sheet copper:	
J. H. Chesley & Co	18.25
Charles H. Pleasants	19.24
W. T. & F. B. Weaver	18.00
Aquila Rich *	16.00
Class 17—Continued.	
Manhattan Supply Co	$20.00
A. P. Swoyer & Co	16.90
Harry L. Briggs	18.00
George L. Neville	40.00
W. A. Pate	19.00
Class 18.—Packing:	
J. H Chesley & Co	26.70
Aquila Rich	36.00
Manhattan Supply Co	24.00
Henry M. Howard	36.00
George L. Neville	60.00
W. A. Pate	22.80
McFadden Co.*	21.00
Class 19.—Paints:	
Charles H. Pleasants	159.12
Daniel Shannahan	180.58
Charles Becker	157.40
George Ryneal, jr	167.73
Shoemaker & Busch *	142.57
Manhattan Supply Co	203.57
George L. Neville	310.00
Class 20.—Stationery:	
Charles H. Pleasants *	26.73
Manhattan Supply Co	40.70
J. W. Bond & Co	61.50
George L. Neville	56.00
Class 21.—Files:	
J. H. Chesley & Co	83.56
W. T. & F. B. Weaver	84.97
Manhattan Supply Co	86.94
A. P. Swoyer & Co.*	71.25
Harry L. Briggs	71.51
George L. Neville	146.75
W. A. Pate	81.99
McFadden Co	85.79
Class 22.—Push cars:	
Charles H. Pleasants	138.48
W. T. & F. B. Weaver	98.00
Eugene L. Maxwell	66.00
Manhattan Supply Co	88.00
McFadden Co. *	60.00
J. B. Kendall	120.00
Class 23.—Hydraulic jacks:	
S. C. Forsaith Machine Co.	219.60
Charles H. Pleasants	218.98
W. T. & F. B. Weaver	215.00
Francis H. Sullivan	210.00
Eugene L. Maxwell	220.00
Manhattan Supply Co	168.18
A. P. Swoyer & Co.*	120.26
J. B. Morrell & Co	249.70
Harry L. Briggs	186.50
George L. Neville	500.00
Edwin A. Gaskill	248.00
The Philadelphia Machinery and Supply Co	164.00
Reuter & Mallory	215.00
McFadden Co	159.90
J. B. Kendall	162.00

*Accepted.

*Accepted.

†No award.

*Proposals for supplies for the navy-yard, Mare Island, California, under **Bureau advertisement** dated January 9, 1893; opened February 7, 1893.*

Class 1.—Lumber, oak:	
William Walker	$148.00
A. L. White	142.50
Abraham Powell*	117.80
Class 2.—Lumber, cedar:	
William Walker	392.00
A. L. White	385.00
A. S. Carman	358.75
Abraham Powell*	329.00
Class 3.—Boat, knees:	
A. L. White	180.00
Abraham Powell*	72.00
Class 4.—Nails, screws, etc.:	
Harry L. Briggs	$171.68
Dunham, Carrigan & Hayden Co	172.31
Manhattan Supply Co	184.94
A. P. Swoyer & Co.*	164.81
Miller, Sloss & Scott	179.85
Class 5.—Brass:	
Harry L. Briggs	60.00
Dunham, Carrigan & Hayden Co.*	47.70
Manhattan Supply Co	66.00
A. P. Swoyer & Co	68.75
Miller, Sloss & Scott	54.00

Proposals for supplies for the navy-yard, Boston, Mass., under Bureau advertisement dated January 24, 1893; opened February 9, 1893.

Class 1.—Cable iron:	
J. B. Kendall	$14,448.00
George L. Neville	15,772.40
S. C. Forsaith Machine Co.	14,833.28
James G. Lindsay & Co.*	12,642.00
Class 1—Continued.	
Frank H. Woodruff & Co.	$16,675.40
Brown & Co	25,284.00
T. F. McDonald	15,050.00

Proposals for supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated January 21, 1893; opened February 9, 1893.

Class 1.—Iron:	
J. B. Kendall	$1,252.01
Ira B. White	1,261.14
J. H. Chesley & Co.*	1,225.49
Frank H. Woodruff & Co.	1,261.57
Mayer & Co	1,270.14
Manhattan Supply Co	1,284.91
A. P. Swoyer & Co	1,257.64
S. C. Forsaith Machine Co.	1,319.86
Class 1—Continued.	
George L. Neville	$1,236.60
Thompson C. Gill & Co	1,358.92
Class 2.—Rivets:	
J. H. Chesley & Co	31.12
Frank H. Woodruff & Co.	31.09
Mayer & Co	61.45
A. P. Swoyer & Co.*	27.71
George L. Neville	31.00

Proposals for supplies for the navy-yard, New York, under Bureau advertisement dated January 23, 1893; opened February 9, 1893.

Class 1.—8,000 gallons lubricating and burning oil:	
Borne, Scrymser & Co	$8,080.00
T. J. Gilroy & Co	7,200.00
Fiske Brothers	7,420.00
Class 2.—2,000 gallons cylinder oil:	
Borne, Scrymser & Co	1,720.00
T. J. Gilroy & Co	760.00
Vacuum Oil Co	1,170.00
Fiske Brothers*	755.00
Class 3.—1,500 forks:	
Ansel W. Paine	195.00
Manhattan Supply Co	179.85
Oliver Brothers*	147.75
Class 4.—2,500 spoons:	
Ansel W. Paine	$325.00
Manhattan Supply Co	299.75
Oliver Brothers*	246.25
Class 5.—5,000 yards bleached duck:†	
J. B. Morrell & Co	931.25
Manhattan Supply Co	1,145.00
Class 6.—20,000 spools sewing silk:	
Belding Brothers	833.33
Hans Hemken	684.00
The Heminway & Bartlett Silk Co.*	560.00
Abraham Abraham	600.00

Proposals for supplies for the navy-yard, Washington, D. C., and Naval Proving Ground, Indian Head, Maryland, under Bureau advertisement dated February 2, 1893; opened February 21, 1893.

Class 1.—Files:	
Manhattan Supply Co	$266.13
Morton, Reed & Co	251.61
A. P. Swoyer & Co.*	170.88
W. T. & F. B. Weaver	202.48
Class 1—Continued.	
Harry L. Briggs	$266.83
McFadden Co	186.87
S. C. Forsaith Machine Co.	224.21
Ansel W. Paine	271.56

*Accepted.

†No award.

Proposals for supplies for the navy-yard, Washington, D. C., etc.—Continued.

Class 2.—Tools:	
Manhattan Supply Co.	$364.48
A. P. Swoyer & Co	333.18
J. H. Chesley & Co	283.14
W. T. & F. B. Weaver	359.85
Harry L. Briggs	297.10
McFadden Co.*	269.65
S. C. Forsaith Machine Co.	435.42
Class 3.—Hardware:	
Manhattan Supply Co.	345.31
B. B. Paiste & Co	340.22
A. P. Swoyer & Co	348.05
J. H. Chesley & Co	349.65
W. T. & F. B. Weaver	374.92
Harry L. Briggs	359.89
McFadden Co.*	324.03
Geo. L. Neville	401.28
S. C. Forsaith Machine Co.	500.21
Ansel W. Paine	351.82
Class 4. Tool steel	
Manhattan Supply Co.	70.00
Charles H. Pleasants	70.00
A. P. Swoyer & Co	79.50
W. T. & F. B. Weaver*	39.50
Carpenter Steel Co	50.00
Wm. J. Haines & Co	60.00
The Benj. Atha and Illingworth Co	60.00
Thompson C. Gill & Co	55.00
Class 5.—Belting:	
Manhattan Supply Co.	$82.50
Charles H. Pleasants	81.45
B. P. Paiste & Co	118.50
Page Belting Co	85.20
Class 5—Continued.	
A. P. Swoyer & Co	$92.70
W. T. & F. B. Weaver	90.00
McFadden Co	123.00
Donegan & Swift	93.45
E. Keeler Co	120.00
Graton & Knight Mfg. Co.	88.50
Loeb Bros	84.95
George L. Neville*	77.10
S. C. Forsaith Machine Co.	88.80
Class 6.—Pipes, etc:	
Manhattan Supply Co.	160.32
A. P. Swoyer & Co	157.69
Robert Leitch & Son	155.92
J. H. Chesley & Co	157.40
W. T. & F. B. Weaver	150.10
E. Keeler & Co*	149.98
Class 7 Valves	
Manhattan Supply Co.*	58.75
A. P. Swoyer & Co	79.29
Robert Leitch & Sons	70.20
J. H. Chesley & Co.	62.66
W. T. & F. B. Weaver	59.65
E. Keeler & Co.	67.70
S. C. Forsaith Machine Co.	69.15
Class 8.—One upright tubular boiler:	
Charles H. Pleasants	459.49
Morton, Reed & Co	310.00
Stockton Bartrom	349.00
Eugene L. Maxwell	370.00
Donegan & Swift	329.00
E. Keeler & Co.*	289.00
S. C. Forsaith Machine Co.	333.00

Proposals for supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated February 14, 1893; opened March 7, 1893.

Class 1.—Rivets, etc.:	
George L. Neville	$229.80
J. B. Morrell & Co	134.16
F. H. Woodruff & Co	125.70
Harry L. Briggs*	119.18
A. P. Swoyer & Co	131.70
Class 2.—Flange steel:	
George E. Neville	562.25
Thompson C. Gill & Co	340.44
S. C. Forsaith Machine Co.*	303.97
Linden Steel Co	313.10
F. H. Woodruff & Co	322.90
Class 3.—Angle steel:	
George L. Neville	137.00
Thompson C. Gill & Co	71.08
S. C. Forsaith Machine Co.*	57.60
F. H. Woodruff & Co	65.24
Class 4.—Galvanized iron:	
Charles H. Pleasants	$60.00
S. C. Forsaith Machine Co.	59.25
J. B. Morrell & Co	93.75
F. H. Woodruff & Co	58.50
A. P. Swoyer & Co.*	54.00
Class 5.—Lubricators:	
S. C. Forsaith Machine Co.*	29.40
J. B. Morrell & Co	42.00
Eugene L. Maxwell	36.00
A. P. Swoyer & Co	71.28
Class 7.—Valves, etc	
George L. Neville	598.60
S. C. Forsaith Machine Co.	391.04
E. T. Tweedy	400.12
Eugene L. Maxwell	477.48
A. P. Swoyer & Co.*	372.80

Proposals for supplies for the navy-yard, Boston, Mass., under Bureau advertisement dated February 16, 1893; opend March 7, 1893.

Class 1.—Hardware:	
The A. M. Gardner Hardware Co	$136.33
Ansel W. Paine	127.70
Manhattan Supply Co.*	126.63
Class 2.—Sand:	
Thompson C. Gill & Co	19.42
Ansel W. Paine	20.50
E. P. Cutler & Co.*	15.50
Manhattan Supply Co.	25.30
Class 3.—Flax and twine:	
Ansel W. Paine	$45.00
Manhattan Supply Co.*	44.50
Charles H. Pleasants	51.25
Class 4.—Charcoal	
Gould & Cutter*	16.00
Ansel W. Paine	25.00
Chas. H. Pleasants	28.00
Class 5.—Belting:	
George L. Neville	173.18

* Accepted.

Proposals for supplies for the navy-yard, Boston, Mass., etc.—**Continued.**

Class 5—Continued.	
S. C. Forsaith Machine Co.	$208.60
The A. M. Gardner Hardware Co	222.67
Loeb Bros	188.93
Manhattan Supply Co.*	165.00
Charles H. Pleasants	179.00
A. P. Swoyer & Co	214.00
Page Belting Co.†	180.00
Class 6.—Tools:	
The A. M. Gardner Hardware Co	27.44
Ansel W. Paine	31.30
Manhattan Supply Co	32.05
A. P. Swoyer & Co.*	26.29
Class 7.—Packing:	
George L. Neville	21.20
The A. M. Gardner Hardware Co.*	8.76
Ansel W. Paine	11.80
Manhattan Supply Co	$23.50
Boston Woven Hose and Rubber Co	10.50
Class 8.—Whale oil:	
Gould & Cutler	120.00
Charles M. Childs & Co	119.00
Manhattan Supply Co	146.00
Smith, Kline & French Co.*	114.00
Class 9.—Paints:	
George L. Neville	233.00
Gould & Cutler	155.18
Class 9—Continued.	
The A. M. Gardner Hardware Co	$161.33
Charles M. Childs & Co	151.56
Manhattan Supply Co	182.60
Charles H. Pleasants	157.75
Smith, Kline & French Co.*	143.88
Class 10.—Alcohol:	
Gould & Cutler*	34.35
The A. M. Gardner Hardware Co	34.50
Class 11.—White lead:	
Gould & Cutler	125.95
The A. M. Gardner Hardware Co	132.22
Charles M. Childs & Co	128.12
Manhattan Supply Co	164.00
Charles H. Pleasants	143.80
Smith, Kline & French Co.*	125.57
Class 12.—Pipe fittings:	
S. C. Forsaith Machine Co.	26.00
Ansel W. Paine	39.70
Manhattan Supply Co	39.66
A. P. Swoyer & Co.*	22.61
Class 13.—Sea coal, facings, etc.:	
Gould & Cutler*	9.85
Ansel W. Paine	15.00
E. P. Cutler & Co	10.00
Manhattan Supply Co	23.00

Proposals for supplies for the New York navy-yard, under Bureau advertisement dated February 15, 1893; opened March 7, 1893.

Class 1.—Hose washers:	
George L. Neville	$50.00
Manhattan Supply Co	17.00
Harry L. Briggs*	13.75
J. B. Morrell & Co	20.00
The Gutta-Percha and Rubber Manufacturing Co	17.50
Class 2.—Lime:	
S. W. Niemeyer	72.50
Manhattan Supply Co	74.25
Harry L. Briggs	65.00
Thompson C. Gill & Co.*	23.75
Class 3.—Cotton canvas:	
George L. Neville	3,070.00
G. K. Sheridan & Co†	
Manhattan Supply Co	2,235.00
James R. Thompson*	2,222.00
J. B. Morrell & Co	2,254.66
Class 4.—Flax canvas:	
George L. Neville	420.00
Manhattan Supply Co	400.00
Charles H. Pleasants	397.40
James R. Thompson*	330.00
J. B. Morrell & Co	407.00
Class 5.—Kitchen utensils:	
George L. Neville	174.00
James M. Sharr & Co.*	118.92
Manhattan Supply Co	141.60
Oliver Brothers	133.20
Harry L. Briggs	126.96
J. B. Morrell & Co	161.88
Class 6.—China, glass, and plated ware:	
Hans Hernken	$2,148.00
Wilcox Silver Plate Co	1,434.72
James M. Sharr & Co	1,416.20
Oliver Brothers*	1,376.00
Class 7.—Hardware:	
Manhattan Supply Co	38.50
Oliver Brothers*	35.60
Harry L. Briggs	39.50
Class 8.—Tar:	
Shoemaker & Busch	75.00
George L. Neville	100.00
Manhattan Supply Co	72.00
Harry L. Briggs	87.00
Charles H. Pleasants	106.00
J. B. Morrell & Co.*	68.00
Class 9.—Rungs:	
Manhattan Supply Co	60.00
Eugene L. Maxwell	53.50
Oliver Bros	125.00
Harry L. Briggs	85.00
Thompson C. Gill & Co	275.00
J. B. Morrell & Co.*	51.25
Class 10.—Tape lines, etc.:	
George L. Neville	84.00
E. J. Brooks & Co.*	38.88
Manhattan Supply Co	48.00
Eugene L. Maxwell	97.32
Oliver Brothers	42.84

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* Accepted.

† Informal.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 10—Continued.	
Harry L. Briggs	$41.40
J. B. Morrell & Co	45.00
Class 11.—Matches, etc.:	
Manhattan Supply Co	145.00
Oliver Brothers*	35.01
Harry L. Briggs	36.25
J. B. Morrell & Co	44.20
Class 12.—Flax-packing:	
George L. Neville	80.60
Manhattan Supply Co	48.65
Eugene L. Maxwell	61.20
Oliver Brothers*	25.20
Harry L. Briggs	59.90
Class 13.—Rivet steel:	
J. H. Sternbergh	510.00
S. C. Forsaith Machine Co	1,337.90
Joseph A. McKee	1,360.00
Hans Hemken	654.50
The Linden Steel Co.*	442.00
Manhattan Supply Co	562.30
The Midvale Steel Co	510.00
Park Brother & Co	671.50
F. H. Woodruff & Co	486.00
Class 14.—Steel rods:†	
Joseph A. McKee	91.00
E. J. Brooks & Co	35.40
Hans Hemken	44.62
Manhattan Supply Co	42.80
Eugene L. Maxwell	51.65
Class 15.—Tool steel:	
The Benj. Atha & Illingworth Co.*‡	153.50
Joseph A. McKee	186.12
E. J. Brooks & Co	243.42
Manhattan Supply Co	251.40
The Midvale Steel Co	153.50
Park Brother & Co	307.00
The Carpenter Steel Co	202.10
Class 16.—Micrometer:	
S. C. Forsaith Machine Co	11.00
E. J. Brooks & Co.*	6.72
Manhattan Supply Co	6.90
Eugene L. Maxwell	7.24
Oliver Bros	7.40
Harry L. Briggs	7.80

Class 16—Continued.	
McFadden Co	$6.74
J. B. Morrell & Co	8.90
Class 17.—Tools:	
S. C. Forsaith Machine Co*	367.40
Manhattan Supply Co	407.35
Eugene L. Maxwell	405.85
Oliver Brothers	368.54
Harry L. Briggs	404 04
McFadden Co	405.12
Class 18.—Tobin Bronze:	
Geo. L. Neville	80.00
The Ansonia Brass and Copper Co.*	68.00
J. B. Morrell & Co	72.00
Class 19.—Files:	
Joseph A. McKee	52.47
E. J. Brooks & Co	49.81
Manhattan Supply Co	50.65
Eugene L. Maxwell*	45.25
Oliver Brothers	47.26
Harry L. Briggs	46.15
J. B. Morrell & Co	52.47
Class 20.—Steel plates:	
Wellman Iron and Steel Co	1,453.32
S. C. Forsaith Machine Co	1,420.62
Joseph A. McKee	1,453.32
The Linden Steel Co	1,235.32
Park Bro. & Co	1,798.48
F. H. Woodruff & Co	1,144.49
The Carnegie Steel Co	1,180.88
Class 21.—Steel shapes:	
S. C. Forsaith Machine Co	1,202.60
F. H. Woodruff & Co.*	1,097.85
The Carnegie Steel Co	1,253.46
Class 23.—Packing:	
Revere Rubber Co	100.00
Geo. L. Neville	160.00
Boston Woven Hose and Rubber Co	77.00
Manhattan Supply Co	91.00
Harry L. Briggs	69.00
J. B. Morrell & Co.*	56.00
The Gutta-Percha and Rubber M'f'g Co	70.00

Proposals for diving outfits for the navy-yard, Mare Island, California, under Bureau advertisement dated February 17, 1893; opened March 14, 1893.

Class 1.—2 sets diving outfits complete:	
A. Schrader & Son*	$1,330.00

Proposals for coal for the navy-yard, Boston, Mass., under Bureau advertisement dated February 25, 1893; opened March 14, 1893.

Class 1.—100 tons anthracite coal:	
S. W. Niemeyer	$900.00
George M. Winslow & Co.*	595.00

Proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated February 24, 1893; opened March 14, 1893.

Class 1.—Nuts, etc.:	
J. B. Kendall*	$896.50
Manhattan Supply Co	1,196.50
A. P. Swoyer & Co	980.62
J. H. Sternbergh	1,160.00
J. B. Morrell & Co	1,092.75

Class 3—Continued.	
Eugene L. Maxwell	$1,397.30
McFadden Co	1,037.00
Philadelphia Machinery and Supply Co	1,228.25
George L. Neville	1,113.75

* Accepted. † No award; excessive. ‡ Tie bid.

Proposals for supplies for the navy-yard, Washington, D. C., etc.—**Continued.**

Class 2.—Reamers, etc.:	
J. B. Kendall*	$192.90
Manhattan Supply Co	224.16
J. H. Chesley & Co	302.16
Eugene L. Maxwell	229.80
W. T. & F. B. Weaver	201.90
McFadden Co	203.36
James L. O'Connor	224.22
Philadelphia Machinery and Supply Co	206.40
E. J. Brooks & Co	225.18
Class 3.—Steel figures, etc.:	
Manhattan Supply Co	53.60
A. P. Swoyer & Co	156.80
F. H. Woodruff & Co	120.00
J. H. Chesley & Co	48.48
J. Baumgarten & Son	$150.00
W. T. & F. B. Weaver	46.40
McFadden Co	78.32
James L. O'Connor*	39.30
Thompson C. Gill & Co	187.00
E. J. Brooks & Co	54.30

Class 4.—Padlocks:	
Manhattan Supply Co	$6.60
J. H. Chesley & Co	5.70
W. T. & F. B. Weaver*	4.80
George L. Neville	6.00
Class 5.—Tools:	
Manhattan Supply Co	82.32
A. P. Swoyer & Co	82.43
J. H. Chesley & Co	76.72
W. T. & F. B. Weaver	64.55
McFadden Co	65.35
James L. O'Connor*	59.62
Class 6.—Steel bars:	
J. B. Kendall	103.32
Manhattan Supply Co	159.90
McFadden Co	92.12
Philadelphia Machinery and Supply Co	92.25
George L. Neville*	147.60
E. J. Brooks & Co	92.00

Proposals for supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated February 23, 1893; opened March 14, 1893.

Class 1.—Four steam pumps:	
Marshall T. Davidson*	$7,800.00
Guild & Garrison	9,000.00
Donegan & Swift†	4,150.00
George L. Neville	8,480.00
Class 2.—Mineral, wool, etc.:	
Thompson C. Gill & Co	914.00
Manhattan Supply Co	816.00
Frank J. Gast	692.00
Donegan & Swift	730.00
George L. Neville	688.00
The Western Mineral, Wool and Insulating Fiber Co.	832.00
Waller P. Huff*	672.00
Class 3.—Steel plates:	
The Carnegie steel plates*	3,296.69
F. H. Woodruff & Co	3,760.43
George L. Neville	3,746.08
The Linden Steel Co	4,615.35
Class 4.—Steel shapes:	
The Carnegie Steel Co.*	1,034.23
Thompson C. Gill & Co	1,070.74
F. H. Woodruff & Co	1,139.83
George L. Neville	1,210.60
Class 5.—Red and white lead:	
Shoemaker & Busch	117.95
Smith, Kline & French Co.*	106.58
Charles M. Childs & Co	111.60
Manhattan Supply Co	143.50
Aquila Rich	112.18
Mayer & Co	140.00
George L. Neville	119.00
Wetherell & Bro	106.82
Class 6.—Paints:	
Shoemaker & Busch	85.21
Smith, Kline & French*	83.21
Charles M. Childs & Co	83.30
Manhattan Supply Co	110.93
Aquila Rich	84.80
Mayer & Co	104.65
George L. Neville	97.40

Class 7.—Oil:	
Shoemaker & Busch	$174.00
The Standard Oil Co.*	137.00
Charles M. Childs & Co	174.50
Mayer & Co	155.50
Fiske Bros	147.00
George L. Neville	$142.00
Class 8.—Steel rivets:	
Thompson C. Gill & Co	417.75
F. H. Woodruff & Co	403.09
J. H. Sternberg*	366.45
Geo. L. Neville	574.27
Class 9.—Sheet iron:	
J. H. Chesley & Co	79.39
George L. Neville	80.40
A. P. Swoyer & Co.*	65.33
Class 10.—Sheet copper:	
Manhattan Supply Co	305.43
J. H. Chesley & Co	261.41
Donegan & Swift	268.21
Aquila Rich	266.47
Mayer & Co	493.20
The Ansonia Brass and Copper Co.*	247.46
George L. Neville	259.75
A. P. Swoyer & Co	249.83
Class 11.—Copper tubing:	
Manhattan Supply Co	17.69
J. H. Chesley & Co.*	16.47
Donegan & Swift	18.30
Aquila Rich	20.13
The Ansonia Brass and Copper Co	17.02
George L. Neville	18.30
A. P. Swoyer & Co	18.30
Class 12.—Bar iron:	
Thompson C. Gill & Co	14.59
Manhattan Supply Co	29.04
Aquila Rich	29.04
Mayer & Co	19.97
George L. Neville*	14.82

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*Accepted.

† Informal.

Proposals for supplies for the navy-yard, Norfolk, Va., etc.—Continued.

Class 12—Continued.	
A. P. Swoyer & Co	$19.96
Class 13.—Muntz metal:	
J. H. Chesley & Co	32.43
Donegan & Swift	29.11
Aquila Rich	37.60
Class 13—Continued.	
Mayer & Co	$45.12
The Ansonia Brass and Copper Co	31.96
George L. Neville*	28.20
A. P. Swoyer & Co	28.70

Proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated March 2, 1893; opened March 2, 1893.

Class 1.—Steel castings:	
The Midvale Steel Co	$3,920.64
The Standard Steel Casting Co	3,626.58
Penn Steel Casting and Machine Co	3,553.08
Eureka Cast Steel Co.*	3,430.56
Class 2.—White pine lumber:	
S. C. Forsaith Machine Co.	609.85
Edwin A. Gaskill*	594.00
Class 3.—Hardware:	
Manhattan Supply Co.*	29.66
Class 5.—Reamers:	
Manhattan Supply Co	108.60
J. B. Kendall	99.45
S. C. Forsaith Machine Co.	102.86
Class 5.—Reamers—Continued.	
McFadden Co.*	$ 89.94
James L. O'Connor	100.00
Class 6.—Tools:	
Manhattan Supply Co	333.71
S. C. Forsaith Machine Co.*	312.74
McFadden Co	435.25
James L. O'Connor	412.72
Class 7.—Crucibles:	
Manhattan Supply Co.*	246.05
J. B. Kendall	292.60
S. C. Forsaith Machine Co.	263.34
Robert J. Taylor & Son	279.30
McFadden Co	263.34
James L. O'Connor	269.99

Proposals for supplies for the navy-yard, New York, under Bureau advertisement dated March 1, 1893; opened March 21, 1893.

Class 1.—40,000 pounds wheat flour in half barrels, 30,000 pounds wheat flour in barrels:	
Manhattan Supply Co.*	$1,414.00
John J. O'Rorke	1,458.00
Charles E. Ahrens	1,435.00
Charles F. Goodwin & Son	1,462.68
Rowland & Co	1,456.00
George B. Robinson	1,500.00
J. B. Morsell & Co	1,685.00
Class 2.—5,000 pounds oatmeal:	
Manhattan Supply Co	286.50
John J. O'Rorke	204.50
Charles E. Ahrens*	200.00
J. B. Morsell & Co	237.50
Class 3.—5,000 boxes blacking:	
Manhattan Supply Co.*†	142.50
Isaac E. Hirsh	175.00
John J. O'Rorke	159.00
Charles E. Ahrens	150.00
J. B. Morsell & Co	190.00
James L. O'Connor	142.50
Richard S. Mason	168.75
Class 4.—5,000 spools cotton:	
Manhattan Supply Co	160.00
William Wilson*	159.38
Class 5.—5,000 papers needles:	
The Manhattan Supply Co.	174.50
James L. O'Connor *	144.50
Class 6.—Yellow-pine lumber:	
George L. Neville	8,200.00
Watson & Pittinger *	6,370.00
James Bigler	9,990.00
Class 7.—Yellow-pine logs:	
George L. Neville	5,771.07
Watson & Pittinger	6,905.07
James Bigler *	4,521.01
Class 8.—Steel plates:	
The S. C. Forsaith Machine Co	$230.30
The Linder Steel Co	246.05
Carnegie Steel Co	194.87
F. H. Woodruff & Co. * †	194.87
Thompson C. Gill & Co	245.06
Class 13.—Bolts:	
J. H. Sternbergh *	223.29
Class 14.—Valves:	
The Manhattan Supply Co.	473.20
Morse Burtis { bid A	410.92
Morse Burtis { bid B *	440.00
The S. C. Forsaith Machine Co	541.20
E. T. Tweedy	482.64
Fred. Stone	440.36
Class 15.—Iron:	
Oliver Brothers	127.00
Thompson C. Gill & Co.*	115.90
Class 16.—Brass hooping:	
The Manhattan Supply Co.*	57.00
The S. C. Forsaith Machine Co	65.29
The Ansonia Brass and Copper Co	60.19
Merchant & Co.‡	61.75
J. H. Chesley & Co	66.50
James L. O'Connor	65.37
A. P. Swoyer & Co	63.67
Class 17.—Hardware:	
The Manhattan Supply Co.*	44.32
James L. O'Connor	44.33
Class 18.—Canvas, etc.:	
The Manhattan Supply Co.	13.40
J. B. Morrell & Co. *	12.50

* Accepted. † Decided by lot. ‡ Informal.

Proposals for supplies for the navy-yard, New York, etc.—Continued.

Class 19.—Lamps and fixtures:	
The Manhattan Supply Co. *	$11.39
Class 20.—Tools:	
The Manhattan Supply Co.	94.78
James L. O'Connor *	89.22
Class 21.—Sheathing metal, etc.:	
The Manhattan Supply Co. *	22.50
J. H. Chesley & Co	24.85
Class 22.—Hose:	
The Manhattan Supply Co.	22.10
Waterbury Rubber Co	27.70
Class 23.—Paints:	
The Manhattan Supply Co.	$9.45
J. B. Morrell & Co.*	8.70
Class 24.—Pipe and pipe fittings:	
The Manhattan Supply Co.	67.23
The S. C. Forsaith Machine Co	56.14
James L. O'Conner *	47.45
Class 25.—Gaskets, etc.:	
The Manhattan Supply Co.*	72.40
Class 26.—Packing:	
The Manhattan Supply Co.*	131.00

Proposals for 75,000 pounds tobacco for the New York navy-yard, under Bureau advertisement dated February 18, 1893; opened March 28, 1893.

Class 1.—75,000 pounds tobacco:		
Buchanan & Lyall		†$0.33
John H. Maclin		†.32$\frac{95}{100}$
Wm. Thomas Hancock		†.31½
P. Lorillard Co		†.30$\frac{75}{100}$
Francis H. Leggett & Co.	sample X	†.30$\frac{27}{100}$
	sample Y	†.32$\frac{64}{100}$
	sample Z	†.35$\frac{70}{100}$
Class 1.—Continued:		
J. B. Morrell & Co.	sample A	†$0.35½
	sample B	†.33⅓
Butler & Bosher		.31$\frac{70}{100}$
P. H. Mayo & Co.	sample A	†.33
	sample B	†.28½
S. W. Venable Tobacco Co.*		†.29$\frac{75}{100}$

Proposals for supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated March 17, 1893; opened April 4, 1893.

Class 1.—190,000 Belgian paving blocks:	
The Manhattan Supply Co.	$15,181.00
S. W. Niemeyer	16,150.00
George L. Neville	14,231.00
E. C. Brooks & Co	15,675.00
Rennie & McIntosh *	13,368.00
Class 2.—500 cubic yards sand:	
E. L. Lask	$375.00
John T. Bolton *	322.50
S. W. Niemeyer	412.50
Geo. L. Neville	350.00
Baker & Cuffee	323.75
E. C. Brooks & Co	425.00

Proposals for supplies for the navy-yard, New York, under Bureau advertisement dated March 15, 1893; opened April 4, 1893.

Class 1.—20,000 neckerchiefs:	
The Manhattan Supply Co.	$19,994.00
Uriah G. Fox*	19,390.00
Class 2.—3,000 yards tan duck:	
The Manhattan Supply Co.	747.00
J. B. Morrell & Co	648.00
Class 3.—1,000 mattresses:	
P. H. G. Dayly	3,290.00
The Manhattan Supply Co.*	3,690.00
Harvey D. Dougherty	2,990.00
Wm. F. Bernstein*	2,830.00
Abraham Abraham	3,240.00
A. Harper	3,020.00
Class 4.—2,500 mattress covers:	
The Manhattan Supply Co.*	1,700.00
Abraham Abraham‡	1,573.25
Class 5.—500 dozen rubber buttons:	
The Manhattan Supply Co.	99.85
The India Rubber Comb Co.*	93.75
Class 6.—Mess kettles (500):	
The Manhattan Supply Co.	$262.50
Class 7.—1,000 razors:	
The Manhattan Supply Co.	647.00
Oliver Brothers	390.00
Ira B. White	437.00
Harry L. Briggs*§	390.00
Class 8.—5,000 pairs calfskin shoes:	
Geo. F. Roedel*	6,900.00
Munroes, Packard & Linscott	7,368.75
Watsontown Boot and Shoe Co.	8,900.00
Class 9.—5,000 gals. oil, L. & B:	
Swann & Finch Co	5,500.00
The Manhattan Oil Co	4,875.00
Borne, Scrymser & Co	4,900.00
Fiske Bros.*	4,845.00
A. S. Holmes	4,950.00
Class 10.—Boiler tubes:	
S. C. Forsaith Machine Co.	2,452.00
The Allison Manufacturing Co.*	1,610.00

* Accepted. † Per pound. ‡ Informal. § Decided by lot.

Proposals for supplies for the navy-yard, New York, etc.—Continued.

Class 11.—Lumber, yellow pine:	
S. C. Forsaith Machine Co.	$638.22
James Bigler	821.24
Watson & Pittinger*	626.19
Class 12.—Lumber, spruce:	
Dodge & Co	1,350.00
Chas. E. Pell	1,177.20
S. C. Forsaith Machine Co.	1,197.00
Watson & Pittinger*	1,155.00
Class 13.—Lumber, white pine:	
Dodge & Co	120.00
Chas. E. Pell	81.00
S. C. Forsaith Machine Co.	108.00
James Bigler	90.00
Watson & Pittinger*	68.00
Class 14.—Locks, etc.:	
Oliver Brothers	4,770.46
J. H. Chesley & Co.*	3,277.97
Ira B. White	4,384.74
Harry L. Briggs	3,317.96
Class 15.—Flange steel:	
Manhattan Supply Co	121.62
Frank H. Woodruff & Co.*	103.86
S. C. Forsaith Machine Co.	118.14
Class 16.—Iron plates:	
Manhattan Supply Co	62.80
J. H. Chesley & Co	54.85
Frank H. Woodruff & Co.*	51.68
S. C. Forsaith Machine Co.	64.37
Thompson C. Gill & Co	59.32
Class 17.—Angle iron:	
Manhattan Supply Co	61.11
S. C. Forsaith Machine Co.	52.06
Thompson C. Gill & Co.*	36.37
Class 18.—Angle steel:	
Manhattan Supply Co.*†	54.39
Frank H. Woodruff & Co.	54.39
S. C. Forsaith Machine Co.	99.43
Class 19.—Copper tubes:	
Manhattan Supply Co	$40.50
The Ansonia Brass and Copper Co.*	39.98
S. C. Forsaith Machine Co.	46.40
Class 20.—Pipe fittings:	
Manhattan Supply Co.*	43.90
E. T. Tweedy	92.10
Class 21.—Valves:	
Manhattan Supply Co	78.90
Oliver Brothers*	69.96
E. T. Tweedy	73.08
Fairbanks Co	151.38
S. C. Forsaith Machine Co.	92.88
Class 22.—Gauges:	
Manhattan Supply Co	82.80
Oliver Brothers	80.40
E. T. Tweedy	76.80
Eugene L. Maxwell*	75.24
S. C. Forsaith Machine Co.	89.40
Class 23.—Rivets, bolts, etc.:	
J. H. Sternbergh*	114.68
Class 24.—Whistles:	
Manhattan Supply Co	37.20
E. T. Tweedy	33.00
Eugene L. Maxwell*	28.14
S. C. Forsaith Machine Co.	29.22
Class 25.—Sheet brass:	
Manhattan Supply Co	78.96
The Ansonia Brass and Copper Co.*	50.40
Class 26.—Fire felt:	
Manhattan Supply Co.*	32.40
E. T. Tweedy	37.80
Class 27.—Tube expanders:	
Manhattan Supply Co	92.40
Frank H. Woodruff & Co.	87.00
Eugene L. Maxwell*	68.94
S. C. Forsaith Machine Co.	86.40

Proposals for coal for the navy-yard, Boston, Mass., under Bureau advertisement dated March 24, 1893; opened April 11, 1893.

Class 1.—250 tons anthracite coal:	
Geo. M. Winslow & Co	$1,487.50
David Duncan & Son*	1,222.50
S. W. Niemeyer	1,610.00
Albert Walker & Co	1,425.00
Samuel G. French	1,280.00
Charles A. Campbell	1,375.00
Class 2.—50 tons bituminous coal:	
George M. Winslow & Co.	$225.00
David Duncan & Son*	187.00
S. W. Niemeyer	375.00
Albert Walker & Co	245.00
Samuel G. French	226.00
Charles A. Campbell	225.00

Proposals for supplies for the navy-yard, New York, under Bureau advertisement dated March 22; opened April 11, 1893.

Class 1.—Bolts, etc.:	
George L. Neville	$795.70
Manhattan Supply Co	848.45
J. B. Morrell & Co	907.80
Frank H. Woodruff & Co.	818.55
S. C. Forsaith Machine Co.	791.48
J. H. Sternbergh*	770.80
Class 2—Spruce piles:	
George L. Neville	1,800.00
James Bigler*	3,210.00
Geo. Karr & Co	3,780.00
Class 2—Continued.	
D. M. Hurley	$3,600.00
Chas. E. Pell	4,788,00
Watson & Pittinger	3,720.00
Class 3.—Oak piles:	
George L. Neville	658.00
James Bigler	784.00
Geo. Karr & Co	574.00
D. M. Hurley	554.40
Charles E. Pell	755.44
Watson & Pittinger	616.00

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*Accepted.

† Decided by lot.

Proposals for supplies for the navy-yard, New York, etc.—**Continued.**

Class 4.—Portland cement:	
George L. Neville	$3,045.00
Manhattan Supply Co.*	2,222.85
Emil Thiele	2,509.50
James Brand	2,383.50
Arthur C. Babson	2,509.50
Ira C. Hutchinson	2,304.75
Bradford Kennedy Sons & McGuire	3,412.50
Watson & Pittinger	2,929.50
Class 5.—Yellow pine:	
George L. Neville	6,377.58
James Bigler	6,553.48
Dooley & Ayres	7,782.26
S. C. Forsaith Machine Co.	7,248.14
Chas. E. Pell	9,169.19
Watson & Pittinger	6,700.92
Class 6.—Sand:	
Manhattan Supply Co	416.50
Nicholas Ryan	525.00
Daniel J. Donavan	245.00
Wm. D. Patten	238.00
John S. Howell*	224.00
Jeremiah Reid	227.50
Class 7.—Broken stone:	
Manhattan Supply Co	2,145.00
Nicholas Ryan { bid A	1,595.00
Nicholas Ryan { bid B	1,925.00
Daniel J. Donovan	1,793.00
Class 7—Continued.	
Wm. D. Patten	$1,672.00
Walter C. Butler	1,636.25
John S. Howell*	1,589.50
Class 8.—Paving blocks:	
Manhattan Supply Co.*	19,995.20
John Donaldson	12,800.00
James Symington	12,320.00
Class 9.—Rosendale cement:	
Manhattan Supply Co	104.00
Nicholas Ryan	150.00
Walter C. Butler*	100.00
Bradford, Kennedy Sons & McGuire	150.00
Watson & Pittinger	120.00
Class 10.—Flagging, curbing, etc.:	
Manhattan Supply Co	5,340.00
Dooley & Ayres*	4,810.00
James Symington	6,210.23
Class 11.—Terra cotta:	
Manhattan Supply Co.*	79.00
Class 12.—Paving sand:	
Manhattan Supply Co	1,308.00
Nicholas Ryan*	720.00
Wm. D. Patten	936.00
John S. Howell	792.00
Jeremiah Reid	780.00

Proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated March 23, 1893; opened April 11, 1893.

Class 1.—200 sheets felt:	
George L. Neville	$2,198.00
Manhattan Supply Co	1,146.00
McFadden Co	1,920.00
E. T. Tweedy	1,320.00
J. B. Kendall*	990.00
Class 2.—Yellow pine:	
Geo. L. Neville*	1,788.00
Edwin A. Gaskill	1,869.70
Class 3.—Stove bolts:	
Geo. L. Neville	22.50
J. H. Chesley & Co	8.63
W. T. & F. B. Weaver	11.10
Manhattan Supply Co	12.00
McFadden Co	8.59
Smith Courtney Co	8.43
Harry L. Briggs	13.25
Eugene L. Maxwell	8.02
Bradford, Kennedy Sons & McGuire*	7.41
Class 4.—Hardware:	
Geo. L. Neville	33.50
Manhattan Supply Co	32.15
McFadden Co.*	23.95
A. P. Swoyer & Co	26.55
* Accepted.	
Class 5.—Tools:	
Geo. L. Neville	557.00
Manhattan Supply Co.*	236.85
McFadden Co	252.40
Harry L. Briggs	261.76
A. P. Swoyer & Co	273.82
Eugene L. Maxwell	337.00
S. C. Forsaith Machine Co.	277.22
Class 6.—Paints:	
Geo. L. Neville	$76.50
Manhattan Supply Co	85.00
Aquila Rich	72.00
Shoemaker & Busch	58.20
Chas. H Pleasants*	52.10
Bradford, Kennedy Sons & McGuire	73.90
Class 7.—Files:	
Geo. L. Neville	260.00
J. H. Chesley & Co	143.81
W. T. & F. B. Weaver	147.15
Manhattan Supply Co	154.30
McFadden Co.*	135.79
Smith Courtney Co.	158.22
E. J. Brooks & Co	155.20
Harry L. Briggs	143.32
A. P. Swoyer & Co	149.59
Eugene L. Maxwell	146.17
Bradford, Kennedy Sons & McGuire	149.80
Class 8.—Tool steel:	
Geo. L. Neville	6,331.50
Carpenter Steel Co	1,809.00
Saunderson Bros. Steel Co.	2,014.80
The Midvale Steel Co	1,809.00
The Crescent Steel Co	2,595.40
Brown & Co	1,388.38
Benj. Atha & Illingworth Co.*	1,218.28
J. B. Kendall	1,392.93
Bradford, Kennedy Sons & McGuire	2,849.40

* Accepted.

Proposals for supplies for the navy-yard, Washington, D. C., etc.—Continued.

Class 9.—Iron:	
Geo. L. Neville	$10.50
Thompson C. Gill & Co	6.50
A. P. Swoyer & Co	5.90
J. B. Kendall	6.00
Bradford, Kennedy Sons & McGuire*	3.50
Class 10.—Leather belting:	
Geo. L. Neville	1,024.80
Loeb Brothers	1,102.33
W. T. & F. B. Weaver	1,185.52
Manhattan Supply Co	973.88
The Graton & Knight Manufacturing Co	1,054.48
McFadden Co	1,619.34
Smith Courtney Co	1,445.70
Keim Belting Co	978.40
E. J. Brooks & Co	1,217.65
Melville Lindsay	1,149.46
Chas. H. Pleasants	1,071.90
A. P. Swoyer & Co	1,236.56
Page Belting Co.*	970.06
Bradford, Kennedy Sons & McGuire	1,175.52
S. C. Forsaith Machine Co.	1.069.84
Class 11.—Steam traps, etc.:	
Geo. L. Neville	61.25
W. T. & F. B. Weaver	52.10
Manhattan Supply Co	45.02
McFadden Co.*	41.88
Ford & Kendig Co	42.55
Robert Leitch & Sons	48.82
E. T. Tweedy	48.83
Eugene L. Maxwell	48.20
S. C. Forsaith Machine Co.	193.40
Class 12.—Packing:	
Geo. L. Neville	$95.00
Manhattan Supply Co	87.00
McFadden Co	90.91
Smith Courtney Co	100.00
Aquila Rich	173.00
Harry L. Briggs*	68.00
Gutta-Percha and Rubber Manufacturing Co	137.00
Class 13.—Pipe and fittings:	
Geo. L. Neville	479.50
W. T. & F. B. Weaver	357.65
Manhattan Supply Co	277.85
Smith Courtney Co	330.49
Ford & Kendig Co	273.25
Robert Leitch & Sons	355.91
E. T. Tweedy*	261.45
A. P. Swoyer & Co	302.45
J. B. Kendall	325.43
S. C. Forsaith Machine Co.	392.81
Class 14.—Valves:	
Geo. L. Neville	384.00
W. T. & F. B. Weaver	200.00
Manhattan Supply Co	456.80
Ford & Kendig Co	134.00
A. P. Swoyer & Co	140.40
S. C. Forsaith Machine Co.*	110.40
Class 15.—Copper:	
Geo. L. Neville	9,374.92
Manhattan Supply Co	9,272.50
The American Metal Co	Informal.
Adolph Lewisohn	8,925.00
J. B. Kendall*	8,662.50
S. C. Forsaith Machine Co.	Informal.

*Accepted.

Proposals for supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated March 27, 1893; opened April 18, 1893.

Class 1.—Brick:	
S. W. Niemeyer	$1,000.00
S. C. Forsaith Machine Co.	488.75
J. Albert Waller*	437.50
John H. Broughton	450.00
Manhattan Supply Co	448.50
Class 2.—Cement:	
S. W. Niemeyer	256.50
S. C. Forsaith Machine Co.	198.45
J. Albert Walker*	168.75
John H. Broughton	202.50
Manhattan Supply Co	179.55
Class 3.—Sand:†	
S. W. Niemeyer	120.00
S. C. Forsaith Machine Co.	O. P.
J. Albert Walker	120.00
Class 3.—Sand—Continued.	
John H. Broughton	$160.00
Manhattan Supply Co	138.00
Class 4.—Fire brick:	
S. W. Niemeyer	220.00
S. C. Forsaith Machine Co.	164.00
J. Albert Walker*	142.00
John H. Broughton	160.00
Manhattan Supply Co	157.60
Class 5.—Fire clay:	
S. W. Niemeyer	87.50
S. C. Forsaith Machine Co.	57.00
J. Albert Walker*	50.00
John H. Broughton	75.00
Manhattan Supply Co	55.75

Proposals for supplies for the New York navy-yard, under Bureau advertisement dated March 25, 1893; opened April 18, 1893.

Class 1.—30,000 pounds ingot copper:	
The American Metal Co	$3,450.00
J. B. Kendall*	3,393.00
Leonard Lewisohn	3,435.00
S. C. Forsaith Machine Co.	3,579.00
F. H. Woodruff & Co	3,720.00
Manhattan Supply Co	3,582.00
Class 2.—350 tons bituminous coal:	
Peale, Peacock & Kerr	$1,204.00
David Duncan & Son*	1,186.50
Barber & Zeigler	1,270.50
Berwind White Coal Mining Co	1,295.00

* Accepted.

† No award.

Proposals for supplies for the New York navy-yard, etc.—Continued.

Class 3.—10,000 gallons beans:	
Kemp, Day & Co	$3,325.00
John J. O'Rorke*	3,119.00
Francis H. Leggett & Co.	3,193.00
Class 3—Continued.	
Manhattan Supply Co	$3,120.00
Chas. E. Ahrens	3,189.00
W. H. Belford	3,257.00

Proposals for lumber for the League Island navy-yard, Pennsylvania, under Bureau advertisement dated March 31, 1893; opened April 18, 1893.

Class 1.—Yellow pine:	
Chas. Este	$665.70
George L. Neville	888.00
Edwin A. Gaskill*	643.80
Class 2.—Hemlock and white pine:	
Chas. Este	$424.00
S. C. Forsaith Machine Co.	541.00
Edwin A. Gaskill*	354.00

*Accepted.

Proposals for supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated April 1, 1893; opened April 18, 1893.

Class 1.—Iron:	
Geo. L. Neville	$873.21
E. V. White & Co	987.43
Frank H. Woodruff & Co.	843.32
J. B. Kendall A	832.65
B	960.75
Class 1.—Iron—Continued.	
S. C. Forsaith Machine Co.	$934.70
A. P. Swoyer & Co	827.31
Manhattan Supply Co	939.40
Donegan & Swift	907.37
Thompson C. Gill & Co.*	821.98

Proposals for supplies for the Naval Academy, Annapolis, Md., under Bureau advertisement dated March 30, 1893; opened April 18, 1893.

Class 1.—Hardware:	
J. H. Chesley & Co	$150.87
Joseph S. M. Basil*	148.24
A. P. Swoyer & Co	233.11
Harry L. Briggs	149.42
Class 2.—Brick:	
Geo. N. Potee*	182.00
Joseph S. M. Basil	184.45
Class 3.—Cement, gravel, sand:	
Joseph S. M. Basil*	210.30
Class 4.—Alcohol:	
Chas. H. Pleasants	195.51
Aquila Rich	119.50
Joseph S. M. Basil	124.50
Shoemaker & Busch*	114.00
Class 5.—Paints:	
Chas. M. Childs & Co.*	366.30
Chas. H. Pleasants	423.34
Hanline Bros	397.16
William Shutt	468.00
Hugh Reilly	531.70
Aquila Rich	445.23
Joseph S. M. Basil	403.73
A. P. Swoyer & Co	421.13
Manhattan Supply Co	502.65
Shoemaker & Busch	372.64
Class 6.—White lead:	
Charles M. Childs & Co.*	189.00
Chas. H. Pleasants	217.50
Hanline Bros	198.75
Wetherill & Bros	189.90
Wm. Shutt	205.50
Hugh Reilly	192.00
Aquila Rich	191.70
Joseph S. M. Basil	189.90
A. P. Swoyer & Co	194.70
Manhattan Supply Co	217.50
Shoemaker & Busch	202.20
Class 7.—Bath boiler:	
Ford & Kendig Co.*	$29.76
J. H. Chesley & Co	35.22
Joseph S. M. Basil	33.00
A. P. Swoyer & Co	36.00
Thompson C. Gill & Co	89.34
Class 8.—Pipe and fittings:	
Ford & Kendig Co.*	137.98
S. C. Forsaith Machine Co.	308.84
J. H. Chesley & Co	186.62
Joseph S. M. Basil	173.29
A. P. Swoyer & Co	151.30
Manhattan Supply Co	218.94
Harry L. Briggs	203.00
Class 9.—Bath tubs:	
Ford & Kendig*	21.98
J. H. Chesley & Co	29.70
Joseph S. M. Basil	27.75
A. P. Swoyer & Co	24.30
Class 10.—Tools:	
Joseph S. M. Basil*	9.20
A. P. Swoyer & Co	14.72
Class 11:	
J. H. Chesley & Co.*	
Joseph S. M. Basil	[illegible]
A. P. Swoyer & Co	[illegible]
Harry L. Briggs	[illegible]
Class 12.—Dry goods:	
Joseph S. [illegible]	
A. P. Sw[illegible]	
Harry L. [illegible]	
Class 13.—	
J. H. [illegible]	
Jose[illegible]	
A[illegible]	
F[illegible]	
Clas[illegible]	

* Accepted.

Proposals for supplies for the Naval Academy, Annapolis, Md., etc.—Continued.

Class 15.—Iron:	
J. H. Chesley & Co	$101.03
Joseph S. M. Basil	108.83
A. P. Swoyer & Co.*	100.00
Class 16.—Gum packing, etc.:	
Aquila Rich	235.50
Joseph S. M. Basil	220.85
A. P. Swoyer & Co	140.51
The Gutta-Percha and Rubber M'f'g Co	210.00
Class 16—Continued.	
Manhattan Supply Co	$235.50
Harry L. Briggs*	125.55
Class 17.—Soap, etc.:	
Chas. H. Pleasants	36.16
Joseph S. M. Basil	34.30
A. P. Swoyer & Co	27.20
Manhattan Supply Co	41.40
Shoemaker & Busche*	26.80

Proposals for supplies for the navy-yard, Mare Island, California, under Bureau advertisement dated March 29, 1893; opened April 25, 1893.

Class 1.—Four fan blowers, U. S. S. *Monadnock*:	
S. C. Forsaith Machine Co.	$2,844.00
B. F. Sturtevant Co.*	2,000.00
The Boston Blower Co	2,596.00
Buffalo Forge Co	2,396.00
Class 4.—Rigging leather:	
Alfred J. Marcus	$181.25
C. C. Nichols*	125.00

Proposals for supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated April 12, 1893; opened May 2, 1893.

Class 1.—Brushes, etc.:	
Manhattan Supply Co.*	$40.30
Chandler & Farquhar	42.06
Class 2.—Tools:	
Manhattan Supply Co.*	556.55
Harry L. Briggs*	501.78
S. C. Forsaith Machine Co.	604.68
Chandler & Farquhar	532.82
Class 3.—Metals:	
Manhattan Supply Co	55.00
A. P. Swoyer & Co	40.50
Chandler & Farquhar*	35.20
Chas. H. Pleasants	44.40
Class 4.—Indicator springs:	
Manhattan Supply Co	144.40
A. P. Swoyer & Co	177.84
Crosby Steam Gauge and Valve Co.*	135.00
S. C. Forsaith Machine Co.	144.00
Class 5.—Sponges:	
Manhattan Supply Cor	24.00
A. P. Swoyer & Co	17.60
Harry L. Briggs	14.00
Bradford, Kennedy Sons & McGuire	22.40
Class 5.—Sponges—Continued.	
Shoemaker & Busch*	$11.20
Chas. H. Pleasants	17.80
J. B. Morrell & Co	40.00
Class 6.—Paints:	
Manhattan Supply Co	56.03
Aquila Rich	29.23
Bradford, Kennedy Sons & McGuire*	27.07
Shoemaker & Busch	27.99
Chas. H. Pleasants	32.81
J. B. Morrell & Co	42.80
Class 7.—Alcohol:	
Aquila Rich	45.60
Bradford, Kennedy Sons & McGuire	51.00
Shoemaker & Busch*†	45.60
Chas. H. Pleasants	64.80
Class 8.—Lenses:	
A. P. Swoyer & Co.*	32.46
Chas. H. Pleasants	59.64
J. B. Morrell & Co	45.00

Proposals for supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated April 11, 1893; opened May 2, 1893.

Class 1.—Blocks:	
J. B. Morrell & Co	$69.20
Manhattan Supply Co	65.40
A. P. Swoyer & Co	48.48
Harry L. Briggs	67.40
Geo. L. Neville	105.00
Class 2.—Bolts, etc.:	
J. B. Morrell & Co	69.20
Manhattan Supply Co.*	50.00
J. H. Sternberg	54.80
o. L. Neville	61.00
—Brushes, etc.:	
hattan Supply Co.*	48.16
White	67.55
L. Neville	53.69
Class 4.—Canvas:‡	
J. B. Morrell & Co	$6.80
Manhattan Supply Co	7.20
Ira B. White	8.00
Geo. L. Neville	8.00
Class 5.—Drawing instruments:	
Manhattan Supply Co	154.60
A. P. Swoyer & Co.*	26.44
Geo. L. Neville	69.80
Hume & Bilisoly	51.40
Class 6.—Tools:	
Manhattan Supply Co	1,075.40
A. P. Swoyer & Co.*	913.77
Henry L. Briggs	967.65
S. C. Forsaith Machine Co.	1,243.58

cepted. †By lot. ‡Open purchase amount too small for contract.

Proposals for supplies for the navy-yard, Norfolk, Va., etc.—Continued.

Class 6—Continued.	
Geo. L. Neville	$1,080.00
Class 7.—Metals	
Manhattan Supply Co	85.44
A. P. Swoyer & Co.*	84.56
Ira B. White	107.96
Geo. L. Neville	93.84
Donegan & Swift	89.28
Class 8.—Hose, etc.:	
Manhattan Supply Co	216.60
A. P. Swoyer & Co.*	159.42
The Gutta-Percha and Rubber M'f'g Co	170.50
Ira B. White	211.00
Aquila Rich	183.50
Geo. L. Neville	209.00
Thompson C. Gill & Co	216.70
Class 9.—Packing:	
Manhattan Supply Co	124.00
J. B. Roache	124.00
A. P. Swoyer & Co	126.50
Ira B. White	148.00
Geo. L. Neville	137.00
Fiske Brothers	118.00
Donegan & Swift	132.00
Boston Woven Hose and Rubber Co.*	78.00
Class 10.—Gauges:	
Manhattan Supply Co	23.80
McFadden Co	22.80
A. P. Swoyer & Co.*	22.67
Riehlé Brothers	30.00
S. C. Forsaith Mchine Co.	31.50
Geo. L. Neville	38.00
Donegan & Swift	27.00
Class 11.—Brass Pipe:	
Manhattan Supply Co	295.80
A.P. Swoyer & Co.*	282.75
Bradford, Kennedy Sons & McGuire	302.76
Geo. L. Neville	587.93
Donegan & Swift	304.50
Class 12 Tools	
Manhattan Supply Co	420.20
A. P. Swoyer & Co	417.92
Harry L. Briggs	355.40
Ira B. White	478.10
S. C. Forsaith Machine Co.	510.57
Geo. L. Neville	500.72
Donegan & Swift	378.20
Class 13.—Hydraulic jacks:	
Manhattan Supply Co	580.00
McFadden Co	448.00
J. B. Roache	356.00
A. P. Swoyer & Co	503.60
Ira B. White	349.80
Riehlé Bros	560.00
Francis H. Stillman	340.00
Eugene L. Maxwell	493.00
S. C. Forsaith Machine Co.*	266.68
Geo. L. Neville	490.00
Donegan & Swift	526.00
Class 14.—Steam traps:	
Manhattan Supply Co	220.20
A. P. Swoyer & Co.*	88.20
Geo. L. Neville	89.70
Donegan & Swift	99.99
Class 15.—Valves:	
Manhattan Supply Co	$91.40
A. P. Swoyer & Co.*	65.50
Geo. L. Neville	120.50
Donegan & Swift	75.95
Class 16.—Gauges:	
Manhattan Supply Co	19.20
McFadden Co.*	13.68
A. P. Swoyer & Co	15.60
S. C. Forsaith Machine Co.	21.00
Geo L. Neville	28.50
Donegan & Swift	19.50
Class 17.—Pipe and pipe fittings:	
Manhattan Supply Co	124.68
J B. Boache	49.37
A. P. Swoyer & Co	78.80
Bradford, Kennedy Sons & McGuire	68.73
E. T. Tweedy	66.09
Geo. L. Neville	61.63
Donegan & Swift	73.63
Class 18.—Radiators	
Manhattan Supply Co	36.00
A. P. Swoyer & Co.*	27.46
Geo L. Neville	75.00
Donegan & Swift	36.25
Class 19.—Bolts	
J. H Sternbergh	68.76
Geo. L. Neville	52.87
Class 20.—White pine:	
A. A. McCullough	85.00
A. P. Swoyer & Co.*	49.00
S. C. Forsaith Machine Co.	74.00
Geo. L. Neville	90.00
Class 21.—Wrought iron:	
Manhattan Supply Co	35.70
A. P. Swoyer & Co	23.62
Bradford, Kennedy Sons & McGuire	22.05
Geo. L. Neville*	21.00
Donegan & Swift	42.00
Thompson C. Gill & Co	24.15
Class 22.—Lard oil	
Chas. M. Childs & Co.*	45.00
A. P. Swoyer & Co	57.50
Bradford, Kennedy Sons & McGuire	57.50
Shoemaker & Busch	48.00
George L. Neville	50.00
Fiske Brothers	46.00
Class 23.—Paints	
Chas. M Childs & Co.*	
J. B. Morrell	
Manhattar	
A. P. Sw	
Br	

* Accepted.

Proposals for supplies for the New York navy-yard, under Bureau advertisement dated April 10, 1893; opened May 2, 1893.

Class 1.—3,000 wisp brooms:	
Manhattan Supply Co	$441.00
J. B. Morrell & Co	471.00
Murphy, Liscomb & Co	437.50
Abraham Abraham	480.00
Harry L. Briggs*	417.00
Class 2.—30,000 yards unbleached duck:	
J. B. Morrell & Co	3,199.20
G. K. Sheridan & Co.*	2,835.00
James R. Thompson	2,787.00
Class 3.—25,000 spools sewing silk:	
The Heminway & Bartlett Silk Co.*	700.00
Anton Paimann	992.50
Abraham Abraham	825.00
Class 4.—Rubber gaskets:	
New Jersey Car Spring and Rubber Co	2,409.56
Manhattan Supply Co	1,747.30
J. B. Morrell & Co	1,996.05
Revere Rubber Co	3,063.00
Aquila Rich*	1,386.49
Boston Woven Hose and Rubber Co	2,654.60
Harry L. Briggs	1,813.32
W. D. Allen & Co	1,388.56
S. C. Forsaith Machine Co.	2,203.72
The New York Belting and Packing Co	2,042.00
Class 5.—Files:	
Manhattan Supply Co	91.31
Bradford, Kennedy Sons & McGuire	82.22
Oliver Brothers*	76.38
Joseph A. McKee	85.25
Class 6.—Tools:	
Manhattan Supply Co	160.15
McFacden Co.*	155.06
Harry L. Briggs	170.67
S. C. Forsaith Machine Co.	201.12
Class 7.—Cotton waste, etc.:	
Bradford, Kennedy Sons & McGuire	110.75
Manhattan Supply Co	106.00
Class 7—Continued.	
J. B. Morrell & Co	$106.50
Harry L. Briggs*	105.50
S. C. Forsaith Machine Co.	116.00
Chas. H. Pleasants	139.77
Class 8.—Packing:	
Manhattan Supply Co.*	186.84
Class 9.—Iron:	
Bradford, Kennedy Sons & McGuire*	25.76
Manhattan Supply Co	52.00
Oliver Bros	45.50
Thompson C. Gill & Co	29.25
J. H. Sternbergh	26.30
Chas. H. Pleasants	41.12
A. P. Swoyer	29.25
Class 10.—Lamps:	
William Porter's Sons*	20.88
Porter's Son & Co	23.94
Manhattan Supply Co	26.40
J. B. Morrell & Co	36.00
Harry L. Briggs	45.00
Chas. H. Pleasants	23.94
Class 11.—Set screws:	
Bradford Kennedy Sons & McGuire*	62.80
Manhattan Supply Co	89.90
Oliver Bros	78.18
S. C. Forsaith Machine Co.	76.55
Morse Burtis	70.58
Class 12.—Boiler tubes:	
Pancoast and Rogers	6,060.00
Cornell, Hiscox & Underhill*	3,439.85
The Allison M'f'g Co	4,050.00
Morris Tasker & Co	5,460.00
Class 13.—Brass and copper tubing:	
Geo. L. Neville	5,810.31
Manhattan Supply Co	5,731.19
Merchant & Co	5,769.28
The Ansonia Brass and Copper Co.*	5,581.78
S. C. Forsaith Machine Co.	5,728.39
Morse Burtis	5,948.95
A. P. Swoyer & Co	5,731.19

Proposals for supplies for the navy-yard, New York, under Bureau advertisement dated April 21, 1893; opened May 9, 1893.

Class 1.—2,500 pounds evap. peaches:	
Thurber, Whyland Co	$367.75
Francis H. Leggett & Co.	437.50
John J. O'Rorke*	311.75
Chas. E. Ahrens	350.00
Class 2.—5,000 pounds tea:	
Dundon & Rines	1,410.25
Thurber, Whyland Co*	1,299.00
Francis H. Leggett & Co.	1,424.50
John J. O'Rorke	1,383.50
Chas. E. Ahrens	1,300.00
Class 3.—35,000 pounds sugar:	
Manhattan Supply Co	1,950.00
Thurber, Whyland Co	2,077.00
Class 3.—35,000 pounds sugar—Continued:	
Francis H. Leggett & Co	$1,928.12
John J. O'Rorke	2,024.50
Chas. E. Ahrens*	1,925.00
Class 4.—Paints:	
Chas. M. Childs & Co	1,091.25
Aquila Rich	1,027.00
Wm. M. Lawrence*	936.00
Wm McDonagh & Co	1,191.38
The Taylor Paint and Oil Co	1,401.38
Phillips Ferguson Hanold Co	1,345.00

*Accepted.

Proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated April 20, 1893; opened May 9, 1893.

Class 1.—500 tons bituminous coal:	
Frank A. Kennedy	$1,735.00
Wm. L. Reed*	1,555.00
Stephenson & Bro	1,625.00
Geo. L. Neville	3,250.00
Class 2.—Paraffin oil:	
The Standard Oil Co.*	123.75
Fiske Bros	156.00
Chas. Becker	142.50
Geo. Ryneal, jr	150.00
Geo. L. Neville	148.50
Class 3.—Rape-seed oil:	
Fiske Bros.†	70.00
Chas. Becker	70.00
Geo. Ryneal, jr	71.00
Geo. L. Neville	71.40
Class 4.—White pine:	
Edwin A. Gaskill	2,435.00
Chas. Esté	2,745.00
W. T. Gallaher & Bro	2,399.50
W. T. & F. B. Weaver*	2,398.25
S. C. Forsaith Machine Co.	2,523.00
Geo. L. Neville	2,499.00
Class 5.—Ash and poplar:	
Edwin A. Gaskill	676.00
W. T. & F. B. Weaver*	613.00
Geo. L. Neville	908.00
Class 6.—Yellow pine:	
Edwin A. Gaskill	172.00
Chas. Esté	140.00
W. T. & F. B. Weaver *	110.00
Geo. L. Neville	120.00
Class 7.—Machinery steel:	
J. B. Kendall*	1,019.90
F. H. Woodruff & Co	1,224.50
The Midvale Steel Co	1,170.00
The Benj. Atha & Illingworth Co	1,054.00
Geo. L. Neville	3,100.00
Class 8.—Spring steel:	
J. B. Kendall*	108.00
Class 9.—Wrought iron:	
J. B. Kendall	145.50
F. H. Woodruff & Co	217.50
Thompson C. Gill & Co	149.25
A. P. Swoyer & Co	149.25
McFadden Co	147.75
Class 9—Continued.	
W. T. & F. B. Weaver	$161.25
S. C. Forsaith Machine Co.	157.50
Geo. L. Neville*	145.42
Class 10.—Bolts:	
J. B. Kendall	181.30
A. P. Swoyer & Co.*	153.50
McFadden Co	186.81
Harry L. Briggs	281.40
J. H. Sternbergh	210.00
Geo. L. Neville	175.55
Class 11.—Paints:	
Charles M. Childs	152.90
Aquila Rich*	118.93
Chas. Becker	156.05
Geo. Ryneal, jr	159.95
Geo. L. Neville	192.00
Class 12.—Alcohol:	
Aquila Rich*	113.62
Class 13.—Brass rods:	
J. B. Kendall	975.00
The Manhattan Brass Co.	890.63
A. P. Swoyer & Co	936.75
McFadden Co	935.00
The Ansonia Brass and Copper Co. *†	890.00
Merchant & Co	937.50
W. T. & F. B. Weaver	1,425.00
J. H. Chesley & Co	970.50
S. C. Forsaith Machine Co.	956.25
Geo. L. Neville	937.50
Class 14.—Steel plates:	
The Carbon Steel Co	2,186.47
The Carnegie Steel Co. *	1,292.00
Class 15.—Steel angles:	
J. B. Kendall	54.61
F. H. Woodruff & Co	70.38
The Carnegie Steel Co. *	50.96
Class 16.—Iron rivets:	
J. B. Kendall	60.90
F. H. Woodruff & Co	79.20
Thompson C. Gill & Co	94.42
McFadden Co. *	60.69
Harry L. Briggs	81.90
J. H. Sternbergh	75.00
W. T. & F. B. Weaver	84.00
Geo. L. Neville	88.20

Schedule of proposals for supplies for the navy-yard, Boston, Mass., under Bureau advertisement dated April 27, 1893; opened May 16, 1893.

Class 1.—Pump:	
S. C. Forsaith Machine Co.	$387.00
Donegan & Swift	635.00
Thos. D. Blake*	315.00
Class 2.—Fire hose:	
S. C. Forsaith Machine Co.*	262.50
Page Belting Co	333.33
Boston Woven Hose and Rubber Co	270.00
Donegan & Swift	290.00
Boston Belting Co	300.00
New York Belting and Packing Co	325.00
New Jersey Car Spring and Rubber Co	295.00
Class 2.—Fire hose—Cont'd.	
Manhattan Supply Co	$365.00
A. P. Swoyer & Co	425.00
The Gutta-Percha and Rubber Manufacturing Co.	
The Revere Rubber Co	
Geo. L. Neville	
Class 3.—Pipe and 1	
S. C. Forsaith	
Dom n &	
Man n	
A. P. S.	
E. '	
Class 4	
Ms	

* Accepted.

Schedule of proposals for supplies for the navy-yard, Norfolk, Va., under Bureau advertisement dated April 28, 1893; opened May 16, 1893.

Class 1.—Water gate valves:	
Manhattan Supply Co	$1,050.00
James Bigler	1,040.00
S.C. Forsaith Machine Co.*	979.00
Donegan & Swift*	986.00
Geo. L. Neville	1,038.40
Class 2.—Centrifugal pumps:	
James Bigler	375.00
Donegan & Swift	265.00
Geo. L. Neville†	230.00
Class 3.—Locomotive boiler:	
James Bigler	475.00
Donegan & Swift†	375.00
Geo. L. Neville	445.00
Class 4.—Hardware:	
Manhattan Supply Co	87.45
Geo. L. Neville†	61.63
Ira B. White	90.40
Class 5.—Gum:	
New Jersey Car Spring and Rubber Co	198.28
Gutta-Percha and Rubber Manfacturing Co	212.70
Chas. H. Pleasants	171.36
Manhattan Supply Co	227.58
A. P. Swoyer & Co	279.20
Aquila Rich	191.75
Geo. L. Neville	178.05
Page Belting Co.†	118.97
Ira B. White	183.90
Class 6.—Paints:	
Chas. H. Pleasants	$120.60
Manhattan Supply Co	133.95
Chas. M. Childs & Co	112.00
Shoemaker & Busch†	111.92
Aquila Rich	112.95
Geo. L. Neville	125.45
Ira B. White	115.40
Class 7.—Alcohol:	
Charles H. Pleasants	179.40
Shoemaker & Busch†	135.30
Aquila Rich	133.60
Class 8.—Lenses:	
Chas. H. Pleasants†	98.60
Manhattan Supply Co	95.00
A. P. Swoyer & Co	103.40
Geo. L. Neville	165.00
Class 9.—Oars:	
Chas. H. Pleasants†	25.95
S. W. Niemeyer	48.25
Manhattan Supply Co	27.60
Geo. L. Neville	31.32
Ira B. White	28.80
Class 10.—Spar varnish:	
Chas. H. Pleasants	112.40
Manhattan Supply Co	116.00
Chas. M. Childs & Co.†	60.00
Shoemaker & Busch	98.00
F. W. Wood	88.00
Aquila Rich	93.00
Geo. L. Neville	110.80
Ira B. White	101.20

Schedule of proposals for watch caps for the New York navy-yard, under Bureau advertisement dated May 9, 1893; opened May 25, 1893.

Class 1.—5,000 watch caps:	
Thomas G. Hood	$2,150.00
Hoestmann Bros. & Co.†	2,000.00
Class 1.—Continued.	
Manhattan Supply Co	$2,495.00

Schedule of proposals for supplies for the navy-yard, Portsmouth, N. H., under Bureau advertisement dated May 12, 1893; opened May 31, 1893.

Class 1.—Furniture, etc.:	
Lawrence Wilder & Co	$1,080.60
Keeler & Co.†‡	956.40
Stillson Foster	Informal.
Class 2.—Crockery:	
Lawrence Wilder & Co	$495.00
Wm. A. Shaw†	310.42

Schedule of proposals for supplies for the navy-yard, Boston, Mass., under Bureau advertisement dated May 8, 1893; opened May 31, 1893.

Class 1.—Engine:	
Donegan & Swift	$2,485.00
The Providence Steam Engine Co.†	2,125.00
S. C. Forsaith Machine Co.	2,392.00
Class 2.—Furniture:	
Keeler & Co	$525.50
Lawrence Wilder & Co	581.54
W. B. Moses & Sons†	465.10

Schedule of proposals for supplies for the navy-yard, Washington, D. C., under Bureau advertisement dated May 11, 1893; opened May 31, 1893.

Class 1.—Forgings:	
The Bethlehem Iron Co.†	$24,360.00
The Midvale Steel Co	26,040.00
Class 2.—1,000 feet cotton fire hose:	
New Jersey Car Spring and Rubber Co	569.50
S. C. Forsaith Machine Co.	531.60
Class 2—Continued.	
A. P. Swoyer & Co	$552.80
Eureka Fire Hose Co.†	521.00
The Bethlehem Iron Co.	546.00
Henry J. M. Howard	577.00
W. A. Pate	601.04
Gutta-Percha and Rubber Manufacturing Co	603.00

* Informal. † Accepted. ‡ Award made for $900.40.

Schedule of proposals for supplies for the navy-yard, Washington, D. C., etc.—**Cont'd.**

Class 2—Continued.	
Revere Rubber Co	$618.00
Geo. L. Neville	618.80
New York Belting and Packing Co	668.00
Melville Lindsay	612.50
Class 3.—Files:	
F. P. May & Co	1,443.68
Class 3—Continued.	
Manhattan Supply Co	$1,662.67
Harry L. Briggs	1,691.69
A. P. Swoyer & Co	1,617.68
Chas. A. Moore	1,521.42
Oliver Brothers	1,638.45
McFadden Co.*	1,374.23

Schedule of proposals for supplies for the New York navy-yard, under Bureau advertisement dated May 10, 1893; opened May 31, 1893.

Class 1.—Bolts:	
J. H. Sternbergh*	$295.80
Manhattan Supply Co	419.05
Oliver Bros	419.05
American Ship Windlass Co	493.00
Chas. A. Moore	386.51
Class 2.—White pine:	
The Export Lumber Co	2,075.00
S. C. Forsaith Machine Co	2,800.00
Joseph W. Duryee	2,808.60
Chas. E. Pell	2,057.01
Watson & Pittinger	2,069.00
Loring R. Millen*	1,937.00
W. R. Adams & Co	2,308.00
Class 3.—Mahogany:	
The Export Lumber Co	1,080.00
Chas. E. Pell*	954.00
Watson & Pittinger	990.00
Class 4.—Cherry:	
The Export Lumber Co	1,037.50
Joseph W. Duryee	1,000.00
Chas. E. Pell	989.50
Watson & Pittinger	947.50
Fred. A. Southmayd	1,005.00
W. R. Adams & Co.*	900.00
Class 5.—White ash, etc.:	
The Export Lumber Co	430.00
Joseph W. Duryee	443.00
Chas. E. Pell	426.30
Watson & Pittinger*	390.00
W. R. Adams & Co	408.50
Class 6.—Hardware:	
Manhattan Supply Co	272.45
J. H. Chesley & Co	239.67
Harry L. Briggs	242.97
Class 7.—Brooms, etc.:	
Manhattan Supply Co	43.96
Harry L. Briggs*	35.44
J. B. Morrell & Co	38.20
Chas. A. Moore	48.19
Class 8.—Tools:	
Manhattan Supply Co	48.20
Harry L. Briggs	41.08
Chas. A. Moore*	39.14
Class 9.—Brick:	
Manhattan Supply Co.*	577.50
Class 10.—Rosendale cement:	
Manhattan Supply Co	810.00
Walter C. Butler*	686.00
Class 11.—White sand:	
Manhattan Supply Co.*	91.50
John S. Howell	99.00
Class 12.—Spruce poles, etc.:	
Joseph W. Duryee*	262.00
Chas. E. Pell	439.07
Class 12—Continued.	
Watson & Pittinger	$337.00
W. R. Adams & Co	472.00
Class 13.—Paints:	
Thomas S. Harrison	318.54
Chas. M. Childs & Co	366.45
Manhattan Supply Co	338.25
J. B. Morrell & Co	339.75
Aquila Rich*	314.00
Class 14.—Alcohol:	
Aquila Rich*	109.25
Class 15.—Brushes, etc.:	
Manhattan Supply Co	364.00
Harry L. Briggs	327.00
J. B. Morrell & Co	314.50
Chas A. Moore*	303.50
Class 16.—Silver calls:	
Manhattan Supply Co	68.25
Oliver Bros	68.75
Harry L. Briggs*	67.50
J. B. Morrell & Co	72.50
Aquila Rich	71.25
Class 17.—Squilgees:	
Manhattan Supply Co	138.00
Harry L. Briggs*	95.00
J. B. Morrell & Co	120.00
Chas. A. Moore	128.80
Class 18.—Cotton waste:	
S. C. Forsaith Machine Co.	115.50
Manhattan Supply Co	111.00
Fiske Bros.*	110.50
Harry L. Briggs	116.50
J. B. Morrell & Co	117.00
Chas. A. Moore	116.30
Class 19.—Suction hose:	
S. C. Forsaith Machine Co.	156.60
Manhattan Supply Co	171.00
Fiske Bros	153.00
The Gutta-Percha and Rubber Manufacturing Co.*	133.20
Harry L. Briggs	164.70
Class 20.—Cotton canvas:	
Henry C. Brooking	1,313.25
The Manhattan Supply Co.	1,314.10
Chas. E. Ahrens	1,371.75
G. K. Sheridan & Co.*	1,253.36
J. B. Morrell & Co	1,291.27
N. J. Car Spring and Rubber Co	176.00
Aquila Rich	160.20
Class 21.—Hammock duck, etc.:	
Henry C. Brooking*	861.25
Manhattan Supply Co	976.00
J. B. Morrell & Co	865.00

*Accepted.

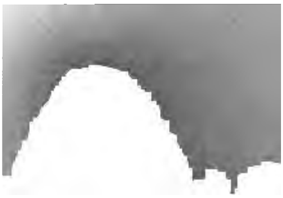
Schedule of proposals for supplies for the New York navy-yard, etc.—Continued.

Class 22.—Flax canvas:	
Henry C. Brooking*	$438.00
Manhattan Supply Co	446.00
J. B. Morrell & Co	490.00
Class 23.—China, glass, and plated ware:	
Wm. A. Shaw	910.00
Clarence E. Breckenridge*	870.34
Class 24.—Lubricating oil:	
Borne, Scrymser & Co.*	132.00
T. J. Gilroy & Co	450.00
A. S. Holmes Co	296.40
Bliven & Carrington	219.00
Fiske Brothers	262.50
Manhattan Oil Co	510.00
Chas. E. Ahrens	563.46
Class 25.—Cylinder oil:	
Borne, Scrymser & Co	93.00
T. J. Gilroy & Co	102.00
A. S. Holmes Co.*	89.70
Bliven & Carrington	105.00
Fiske Brothers	113.70
Manhattan Oil Co	111.00
Alfred F. Bracher	121.50
Class 26.—Lard oil:	
Borne, Scrymser & Co	3,660.00
T. J. Gilroy & Co	3,680.00
Bliven & Carrington	3,600.00
Fiske Brothers	3,428.00
Manhattan Oil Co.*	3,350.00
Class 26—Continued.	
Chas. E. Ahrens	$3,756.40
Class 27.—Kerosene oil:	
Borne, Scrymser & Co	300.00
Fiske Brothers*	270.00
Manhattan Oil Co	300.00
Class 28.—Portland cement:	
Manhattan Supply Co.*	220.00
J. B. Morrell & Co	300.00
Class 29.—Kitchen furniture:	
Manhattan Supply Co	658.70
Harry L. Briggs*	832.40
Class 30.—Coal baskets:	
Manhattan Supply Co.*	417.00
J. B. Morrell & Co	450.00
Charles H. Moore	496.80
Class 31.—Hose-washers:	
Manhattan Supply Co	189.00
The Gutta-Percha and Rubber Manufacturing Co	177.00
Harry L. Briggs	176.25
N. J. Car Spring and Rubber Co	175.00
Class 32.—Lamps, etc.:	
Manhattan Brass Co	2.414.18
Porters Son & Co	2.373.70
Manhattan Supply Co	2,531.80
Harry L. Briggs	2,433.32
Wm. Porters Sons*	2,314.32

Schedule of proposals for supplies for the Norfolk navy-yard, under Bureau advertisement dated May 13, 1893; opened May 31, 1893.

Class 1.—50 tons coke:	
The Nottingham & Wren Co.*	$287.50
Geo. L. Neville	500.00
Class 2.—Capstans:	
S. C. Forsaith Machine Co.*	1,726.00
The American Ship Windlass Co	1,940.00
Class 3.—Steam pipe:	
S. C. Forsaith Machine Co.	162.77
E. T. Tweedy	152.68
Manhattan Supply Co	172.56
Geo. L. Neville	159.70
McFadden Co	153.30
Class 4.—Copper rivets:	
A. P. Swoyer & Co	13.50
Geo. L. Neville*	11.25
Class 5.—Sheet copper:	
J. H. Chesley & Co	70.28
Ansonia Brass and Copper Co.*	64.40
Manhattan Supply Co	66.70
A. P. Swoyer & Co	70.58
Class 5.—Sheet copper—Cont'd.	
Geo. L. Neville	$69.00
McFadden Co	73.14
Class 6.—Copper tubing:	
Ansonia Brass and Copper Co.*	268.20
Manhattan Supply Co	276.89
A. P. Swoyer & Co	270.68
Geo. L. Neville	281.10
Class 7.—Valves:	
S. C. Forsaith Machine Co.	119.00
E. T. Tweedy*	72.00
Manhattan Supply Co	73.60
Geo. L. Neville	116.00
Class 8.—Tools:	
Harry L. Briggs*	346.43
S. C. Forsaith Machine Co.	481.45
Manhattan Supply Co	384.84
The Philadelphia Machinery and Supply Co	383.92
A. P. Swoyer & Co	357.22
Geo. L. Neville	466.72
McFadden Co	350.78

* Accepted.



REPORT

OF THE

SURGEON-GENERAL

U. S. NAVY.

NAVY DEPARTMENT,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., October 1, 1893.

SIR: In obedience to instructions contained in Department's letter of June 15, 1893, I have the honor to report the operations of this Bureau for the last fiscal year, accompanied by duplicate set of annual estimates for the fiscal year ending June 30, 1895, and statistical report showing the health of the Navy for the year 1892. The report embraces a statement of the condition of the naval hospital fund, the naval medical establishment, and other matters of interest pertaining to the duties of the Bureau of Medicine and Surgery.

NAVAL HOSPITAL FUND.

The condition of this fund is as follows:

Balance on hand September 30, 1892	$355,047.08
Transferred to the credit since September 30, 1892	49,371.40
	404,418.48
Expended since September 30, 1892	90,492.67
Balance on hand June 30, 1893	313,925.81

By an act approved July 2, 1890, Congress authorized the Secretary of the Navy to sell to the city of Brooklyn a certain portion of land belonging to the naval hospital ground, and directed that the sum received from such sale be paid into the Treasury for the benefit of the naval hospital fund.

From the sale of said hospital land the sum of $95,048.78 was placed, by appropriation warrant, dated February 18, 1892, to the credit of the naval hospital fund.

NAVAL HOSPITALS.

Under the law, as approved by an act dated February 26, 1811, "the Secretary of the Navy shall have the general charge and superintend- ce of Navy hospitals." Under the same act it further states:

> The Secretary of the Navy shall procure, at suitable places, proper sites for navy pitals, and, if the necessary buildings are not procured with the sites, shall cause

such to be erected, having due regard to economy and giving preference to such plans as, with most convenience and least cost, will admit of subsequent additions, when funds permit and circumstances require.

There are ten naval hospitals, located geographically as follows:

Widows Island, Penobscot Bay, Maine; Portsmouth, N. H.; Chelsea, Mass.; Brooklyn, N. Y.; Philadelphia, Pa.; Washington, D. C.; Norfolk, Va.; Pensacola, Fla.; Mare Island, California, and Yokohoma, Japan.

They are all serviceable, well-appointed establishments, meeting the requirements of the respective stations, excepting the hospital at New York, which will be specially referred to in this report.

Naval hospital, Widows Island, Maine.—Painted hospital building and boathouse; pointed with cement the exterior joints in wall, basement of the main building; repacked piston of Rider hot air-pumps; improved grounds and walks of hospital; repaired and shifted the float from the south to the north side of the wharf, in order that it might be better protected from influences of tide and weather.

This hospital was constructed with special reference to the reception and accommodation of patients from ships infected with epidemic diseases, but the necessity for its occupation as a refuge station for officers and men of the Navy has, so far, not arisen.

Naval hospital, Portsmouth, N. H.—This hospital, situated on the west side of Seaveys Island, about 1,000 feet from the navy-yard, was completed September 10, 1891, the sick being transferred from the old sick quarters at the navy-yard.

During the past year the equipment of the hospital has been completed, the sanitary fittings have been perfected, and many improvements made in the grounds and walks of the hospital.

Naval hospital, Chelsea, Mass.—A few changes have been made, consisting of repairing and painting the outside window frames and sashes of hospital; repainting gutter spouts, and brick and iron work of hospital; refloored four small wards and laundry, also repaired ceilings of the same; repaired and painted outside of director's quarters, portico, and terrace steps.

Many improvements were made by the director of the hospital in the grounds, and in putting in excellent condition all outbuildings attached to the hospital.

Naval hospital, New York.—The following embrace the principal improvements that were made at this hospital during the fiscal year:

Laying floors and repairing roof of coal shed; repairing fence between hospital grounds and the city of Brooklyn; putting in new water-closet and steam radiators in annex hospital; putting up an oven for disinfecting purposes; setting up five porcelain-lined bath tubs, and making an extension to blacksmith shop; erecting a board fence between hospital grounds and cemetery; laying kosmocrete pavement from hospital to gate-house, and in stable.

Naval hospital, Philadelphia, Pa.—Among the improvements that have been made at this hospital during the past fiscal year may be noted the following:

Putting in new water back, new fire-brick lining, and making connections in large range in main kitchen; repairing boilers and steam heating apparatus, and putting in one steam fire pump and connections; putting a new shingle roof on stable and shed attached; partitioning off a dark room for photography, and putting in a sink in the microscope room of hospital, and putting up a 40-gallon galvanized iron tank to supply boiled drinking water.

Naval hospital, Washington, D. C.—This hospital has been entirely renovated. It has been supplied with an efficient heating apparatus; the sanitary arrangements have been overhauled, all interior woodwork painted, neuchatel floors laid in basement, and the wards furnished with new iron bedsteads, comfortable chairs, and durable lockers.

Naval hospital, Norfolk, Va.—Improvements consisted in repairing two boilers, placing gutters and spouts on verandas, relaying hospital walks with shells, repairing fire apparatus, and making many repairs of a miscellaneous character.

Naval hospital, Pensacola, Fla.—A few minor repairs have been made to the buildings, including reshingling of surgeon's quarters, and repairing leaks in larger cistern.

Naval hospital, Mare Island, Cal.—During the past fiscal year the medical director's residence has been completed, and the electric light plant has been introduced into the hospital, director's residence, and grounds.

The hospital building has been almost completely painted within and without, the roof repaired and painted twice, and repairs have been made to the steam building, coal shed, stables, carriage shed, and other outbuildings. The extensive roads and walks within the grounds have been kept under constant inspection and repair, and the fences repaired and whitewashed.

Naval hospital, Yokohama, Japan.—Painted the outside walls and woodwork of the building; repaired the detached ward and refitted it.

NAVY-YARDS.

Recognizing the importance of placing the several navy-yards, naval stations, and marine barracks under the most favorable sanitary conditions, in view of the possibility of cholera or other epidemic diseases gaining a foothold in this country, the Bureau called the attention of the commandants to the necessity and importance of placing and keeping the stations under their command in a thoroughly clean and wholesome condition, recommending frequent and rigid inspections by the medical officers of the stations, special attention to be given to the removal and disposal of garbage and offensive matter, cleaning and disinfection of offensive places, stables, cellars, vaults, sewers, drains, water-closets, etc., and in all respects initiating and carrying out such practical measures as would put the several yards and stations under the most satisfactory hygienic conditions.

Navy-yard, Portsmouth, N. H.—The health of the navy-yard has been good. From the average force of 114 officers and enlisted men there have been 145 admissions to the sick list.

There was a mild epidemic of influenza during the months of January and February.

An inspection of the sanitary condition of the yard, made under the order of the commandant as suggested by this Bureau, showed serious defects in the privies, cesspools, and sewer connected with the officers' quarters. The main sewer has been opened by the Bureau of Yards and Docks in several places and cleaned its entire length, and a portion of it, some 30 feet in length, has been rebuilt by blasting through a ledge of rock. The sewer, however, near the officers' dwellings is sanitarily defective, and no amount of water with the present supply can keep it clear, owing to its slight fall and broad bottom, which is flat at its upper end.

The latrine at the marine barracks for the enlisted men is badly located, the building is old, and affords little or no protection from the weather. Efforts are, however, being made to have a new building constructed. The necessary water supply can be obtained from the river by means of a steam pump.

Navy-yard, Boston, Mass.—During the early part of 1892 epidemic catarrh prevailed extensively at the yard, but there was no mortality from it. Six cases of scarlet fever occurred during the year, but at such intervals and under such circumstances as to entitle them to be classed as sporadic. Two deaths occurred during the year.

The Bureau calls attention to the necessity for the further improvement in the sewerage of the station, to the changes required in the buildings and grounds occupied as a prison, and to the erection of a more suitable building for the purposes of a dispensary.

Navy-yard, New York.—A sanitary inspection of this yard was made in September, 1892, and a liberal supply of disinfectants obtained in view of the possible introduction of cholera.

Should cholera become epidemic in New York and Brooklyn, cases would, in all probability, occur among the workmen of this yard, whose daily average number is estimated at 2,300. Some special arrangement for the temporary treatment of such cases in the yard and for their speedy removal to hospitals is indicated. It would also be well to have the municipal authorities of Brooklyn designate some suitable place to which such cases could be removed.

There are 69 officers attached to the yard and station, exclusive of those on the *Vermont*, *Minnesota*, and at the naval hospital, and United States naval laboratory and department of instruction. The commandant and 8 senior officers occupy residences in the yard.

The families of officers have received medical attention frequently.

Among the employés of the yard, 235 injured or sick workmen have received treatment. The accompanying table gives the character of the injuries and diseases:

INJURIES.

Abrasions	3	Contused wounds	85
Burns	16	Incised wounds	18
Contusions	28	Lacerated wounds	63
Concussions	1	Punctured wounds	1
Fractures	7	Sprains	4

DISEASES.

Cholera morbus	1	Epilepsy	1
Intermittent fever	4	Sunstroke	3

The navy-yard ambulance has been used thirty-six times in carrying sick and injured yard workmen to their homes or to the city hospitals. Stretchers have been distributed to the several workshops, thus securing a prompt removal of injured or sick men to the surgeon's office.

The removal of the laboratory from the office of the medical inspector to another building makes the room vacated available for a medical store room, the present one being now in a building at some distance from this office.

Marine barracks: The introduction of steam heat and electric light is needed. The present uneven brick pavements about the barracks should be replaced by artificial stone. This would obviate the present necessity of frequently removing bricks to repair and clean the underlying drains.

Navy-yard, League Island, Pennsylvania.—The general health of the station has been fair. During June and July there was an outbreak of diarrhœa at the marine barracks, but it quickly subsided. The cause was probably heat and humidity, for people living outside the yard were similarly affected. As a precaution, the drinking water was boiled. The drinking water at the barracks is rain water collected from the roof. To prevent contamination by dust from adjoining truck farms, where human ordure is used as fertilizer, this water has been boiled. The water supply is insufficient and dangerous; the ditch water is contaminated by discharges from the urinal of the barracks and by drainage from fields fertilized with manure. The back channel water is contaminated by sewage from Philadelphia.

Water from the driven well is also bad, being contaminated with rapidly decomposing vegetable organic matter.

The sanitary condition of the navy-yard proper is not satisfactory. It contains many old frame buildings, which are in a state of decay, and the ground is water-soaked.

The houses used as quarters by officers are comfortable in summer, but, from faulty construction and poor material, are very unsatisfactory in winter.

A condensing apparatus for yard and barracks is needed, as the rain water in tanks is not sufficient to supply demands.

There is no regular system of sewers on League Island. A wooden box drain, 12 by 12 inches, receives discharges from the buildings along its course. Some of the drains discharge into the ditch, whose water is used by people on the island. Numerous deep drains are needed, and the ditches about the island should be widened and deepened.

Earth from the islands in front of Philadelphia has been removed and spread over the island, and has served to decrease the number of cases of malarial fever.

Navy-yard, Washington, D. C.—The health of the yard continues satisfactory.

Navy yard, Norfolk, Va.—Influenza was epidemic at the yard during the early part of 1892. Stomach and bowel troubles prevailed extensively during the year, and typhoid fever also occurred among the officers of the yard, the marines, and on board the receiving-ship.

Attention is called to the unsanitary condition of the water-closets and latrines, and the necessity for the improvement of the sewerage of the station.

Navy-yard, Pensacola, Fla.—Sanitary condition of the yard is excellent; but few patients have been entered on the sick list during the year, and these were among persons residing outside of the navy-yard.

Navy-yard, Mare Island, California.—The health of the yard has been satisfactory, but the sanitary condition of the station would be materially improved by making extensive alterations in the present arrangement of sewers and drainage pipes, and overhauling and renovating the entire system of plumbing. The "Snead dry-air closet" will be substituted for the present system of water-closets at the marine barracks, and it is probable that it will be in operation before the close of the fiscal year. It is also proposed to remove the water-closets used by the employés from all buildings, as far as practicable, and to substitute for their use an octagonal privy outside of all inclosures.

NAVAL STATIONS.

Naval training station, Newport, R. I.—This station is lacking in many suitable buildings.

The principal diseases, among a population of more than 500, are rheumatic affections and disorders of the respiratory system. Boys from every part of the country are brought here and exposed for the first time to the rigors of a New England coast. The unusual exposure, which would be much diminished if suitable buildings were provided, causes many to become sick. Last year the following cases of disease occurred: Pneumonitis, 21; laryngitis, 24; bronchitis, 36; pleuritis, 3; catarrhus, 69; tonsilitis, 85; and rhematismus, 29. Many of these patients require segregation and special nursing; yet modern hospital facilities are quite lacking at this station.

There should be erected on this island a suitable hospital at a proper distance from the main buildings, and a dispensary and examining room in connection with the general administration building.

At the same time suitable quarters for officers and attendants should be provided. The necessity for proper examining rooms becomes apparent when it is considered that last year 1,460 examinations and measurements were made.

The old wooden ship *Richmond* remains in fairly good sanitary condition, though her rather low and dark decks and small cubic space are not conducive to the best development of the 100 boys living on board from time to time.

The water supply has not been abundant and during the year several new borings were made with the result of increasing the supply. The quality of the water from the wells used seems fairly good, though there is need of suitable provision for filtering.

Naval station, New London, Conn.—The general health of the station has been good.

Upon the appearance of cholera in New York harbor during the past summer, rigid sanitary precautions were taken.

The personnel of the station has been reduced about twenty by putting the *New Hampshire*, receiving-ship, out of commission.

Annapolis, Md., Naval Academy.—The number of admissions to the sick list were 876 and the sick days 2,977. There were no deaths, and but two transfers to hospital. A few cases of morbilli and varicella occurred, but prompt measures prevented extension.

Attention is again called to the water-closets for cadets and to those at the marine barracks. The cadet closets are provided with obsolete bowls that frequently retain their contents. They have an insufficient flow of water, and the woodwork is offensive. Their situation in a detached building has so far prevented serious trouble. A suitable structure should be erected and provided with a modern system of closets, and the old building destroyed.

The water-closets at the marine barracks are insufficient in number, too small, and badly ventilated, and the main sewer needs extension, that it may empty into deep water.

The system of lighting at the Naval Academy should be changed as soon as practicable. During the last four years there have been 110 admissions to the sick list from eye troubles and 290 from headaches. The total number of sick days from these causes during that period was 1,200. As no inconsiderable portion of this loss has arisen from working in rooms improperly lighted, and containing overheated air, vitiated by gas consumption, it is strongly recommended that a system of electric lighting be installed.

RECEIVING SHIPS.

U. S. receiving ship Wabash.—No diseases of an epidemic or contagious character have prevailed.

The removal of the ship to the lower
a stronger tide, and water free fr

recommended. The water around the ship in her present berth is very impure, owing to the fact that sewers empty into the harbor in this vicinity, and is totally unfit for condensing. The utmost care has to be exercised in watering ship from shore; the hose should contain no breaks, and should not be allowed to rest in the water alongside, but should be kept entirely above it.

In hot weather the adjacent sewers often make the atmosphere around the ship very offensive. In the event of cholera outbreaks the proximity of the ship to these sewers would be a source of great danger.

Many recruits have been kept on board for several months past. All suspicious cases of disease have been promptly sent to the hospital.

U. S. receiving ship Vermont.—The ship has been free from infectious diseases, and its sanitary condition is satisfactory.

The following shows the record of enlistments for the year:

Persons examined	999
Persons accepted	686
Persons rejected	313

U. S. receiving ship Minnesota.—The ship is in good sanitary condition. One hundred and seven men were examined for special service, of whom 13 were rejected; 1,269 boys were examined and 651 were rejected. Of the 618 examined and accepted 191 failed to enlist.

A perceptible improvement is noted in the class of boys presenting themselves for enlistment.

U. S. receiving ship St. Louis.—

Apprentices examined	129
Apprentices rejected	59
Recruits examined	166
Recruits rejected	34

U. S. receiving ship Dale.—Attention is called to the necessity for fitting up a room for conducting the physical examination of recruits; the quarters now used for this purpose being also utilized as a shipping office, and by the ship's yeoman. It is almost impossible, under present conditions for the medical officer to properly perform his duty.

The majority of admissions were for intermittent fever, the increased number of admissions for this disease over the preceding year being probably due to the dredging along the river front.

Five hundred and fifty-two recruits were examined during the year, of these 285 were men, 216 were boys, and 51 were marines.

Of the men 213 were accepted and 72 rejected; of the boys 86 were accepted and 130 rejected, and of the marines 30 were accepted and 21 rejected. There were 6 rejections among the boys examined, for color-blindness.

U S. receiving ship Franklin.—The sanitary condition of the ship has been good.

One hundred and fifty men were examined for general service, of whom 50 were rejected physically.

U. S. receiving ship Independence.—The sanitary condition of the ship is good. There has been no sickness dependent on the conditions of life on board ship.

One thousand three hundred and forty-eight men were examined for enlistment; 1,088 accepted and 260 rejected.

ENLISTMENT OF RECRUITS.

The regulations governing the physical examination of recruits, as prescribed in the "Book of Instructions for Medical Officers," are explicit and comprehensive, and officers are reminded of the necessity for the exercise of the greatest care in the performance of this duty. Furthermore, they are informed that medical examiners will be held strictly accountable to the Department for all improper enlistments.

To carry out faithfully the above instructions, necessarily implies that adequate and suitable provisions exist on the part of the authorities, by which medical officers can comply rigidly with these regulations.

Elistments in the service are made at rendezvous, receiving ships, and on board seagoing ships.

To secure the best results, recruiting for the naval service (exclusive of marines) should be restricted to receiving ships, and these should be fitted up with every convenience and appliance for the thorough and proper performance of this duty.

Recruiting on board of seagoing ships is detrimental to the interests of the service, from the fact that it is impossible, with the facilities at his command, for the medical officer to determine carefully and thoroughly, the physical condition of the recruit.

It is harmful to the medical officer, by encouraging him, through lack of proper appliances and environment, to perform perfunctorily and unsatisfactorily this exacting duty, and, finally, it involves, in many instances, pecuniary loss to the Government, by the enlistment of recruits who, under more favorable circumstances for examination, could not have undergone a rigid scrutiny.

MUSEUM OF HYGIENE.

The Museum of Hygiene was founded and officially recognized by the Congress of the United States in an act making an appropriation for its support for the fiscal year ending June 30, 1883, of which the following is a copy:

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eigthy-three, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated for the objects hereinafter expressed for the fiscal year ending June thirtieth, eighteen hundred and eighty-three, namely:

The Museum of Hygiene: For rent of quarters necessary for the preservation of objects already collected; transportation of contributions intended for exhibition; preparation of models and drawings to be used in the illustration of sanitary science and its progress, seven thousand five hundred dollars.

In a general circular issued by the Bureau subsequent to the passage of the above act, attention was called to the recognition by Congress of the Museum of Hygiene and, to insure its success, the Surgeon-General of the Navy requested the coöperation of physicians, engineers, architects, builders, manufacturers, inventors, and others interested in sanitary science, with the view of representing in its exhibits the present state and future progress of the nation in all departments of hygiene.

Great interest has been manifested by the service, and by professional and scientific bodies in the growth and development of the Museum, as shown by the steady increase in the number of exhibits.

The museum has reached a stage in its development when the Department should take active measures toward securing a more suitable building than the unsightly and illy-arranged one now occupied for the care, preservation, and display of the valuable exhibits, which in the past few years have increased beyond the storage capacity of the present building. The contant additions being made to the museum collection, in connection with its already crowded condition, and the generally admitted fact of the unfitness of the building for its present purpose, renders this step imperative, in order that the exhibits may be properly grouped and classified, and that their value for purposes of study and observation may not be impaired.

The further fact that the present building is badly arranged for the prosecution of microscopical and bacteriological investigations, which have heretofore constituted an important feature in the administration of the museum, is an additional argument in favor of securing more suitable quarters.

The removal of the museum to the buildings of the old observatory is strongly recommended.

U. S. NAVAL LABORATORY AND DEPARTMENT OF INSTRUCTION.

The importance of some instruction for assistant surgeons of the Navy, to familiarize them with the duties of medical officers, ashore and afloat, immediately after admission into the Navy, has been recognized under the present administration of the Navy Department, and the order of the honorable Secretary of the Navy, dated June 22, 1893, requiring such instruction under prescribed rules and regulations, has inaugurated a system that will be of the greatest value to the medical corps of the Navy and the service at large.

The services of officers attached to the hospital, U. S. naval laboratory and department of instruction, and medical examining board will be utilized as instructors, and the course of instruction will continue for a period of not less than three months, and will embrace the following subjects:

(1) Chemistry; general, analytical, and organic.
(2) Hygiene and sanitary science.
(3) Microscopy and microbiology.
(4) Military surgery and operative work.
(5) Clinical medicine and hospital work.
(6) Construction and ventilation of modern war ships.
(7) Examination of recruits, and life-saving methods.
(8) Navy regulations, navy ration, hospital fund, pension fund.
(9) Keeping medical records at hospitals and on board vessels of war, and blank forms pertaining to Bureau of Medicine and Surgery.

A synopsis of the above subjects and rules and regulations governing the system of instruction were published with general order referred to.

Medical Director Delavan Bloodgood, who had charge of Naval Laboratory and Department of Instruction from the date of the order until his retirement on August 20, has been succeeded by Medical Director Henry M. Wells.

One assistant surgeon is already undergoing instruction, and others will be ordered as soon as they are commissioned, after passing a successful examination before the Naval Medical Examining Board, now permanently established at the Naval Station, New York.

Assistant surgeons, on completing their course of instruction, will at once be assigned to duty on receiving ships, and, as soon as practicable thereafter, to duty on modern vessels of war.

SICK QUARTERS AND SANITATION ON BOARD MODERN VESSELS OF WAR OF THE U. S. NAVY.

Although several vessels belonging to the new Navy have been completed, several nearly finished, and several undergoing construction, no intelligent system has been followed, up to the present time, to provide them with suitable sick quarters, properly located for the treatment of sick and wounded officers and men.

The Bureau will submit, at an early date, the result of its investigations on this subject, made through the courteous assistance of the Chief Constructor of the Navy.

On vessels of the class of the *New York*, sick accommodations should be on the gun-deck. The English war vessel *Grafton*, a sister ship to the *New York*, has a large sick-bay amidship on that deck.

Sick bays, on the berth deck forward, have, in nearly every instance, a large hatch leading to a bread, provision, or awning room beneath. This arrangement seriously curtails the swinging space for cots and, as the hatch is liable to be used at most inconvenient hours, is very objectionable. In addition to this, and other well-known objections to having the sick quarters in the bow of the ship, it must be borne in mind that in these modern vessels the berth deck is divided into several water-tight compartments, which are required to be closed in action, during general quarters, and often at sea. At such times not only will the ventilation of such a sick bay be materially affected, but the compartment will be very inaccessible.

These suggestions are based entirely upon a study and examination of the plans of the vessels, and should be confirmed by a personal examination of the ships themselves, to consider if other changes should be made, by investigating the ventilation, removal from sources of heat, noise, etc.

If the results of personal inspection and observations agree, the suggestions should be carried out by the Department.

Such an inspection for all modern vessels of war, whether finished and in commission, undergoing construction, or nearing completion, is highly important and should embrace not only the immediate belongings of the medical department, but a supervision of the general ventilation and sanitary arrangements.

The British admiralty recognizes the necessity of these inspections by appointing a medical officer as inspector-general.

Certainly ship sanitation is as important to us as to others.

It is, therefore, recommended that a competent officer of the medical corps of the Navy be specially detailed to do this work, under cognizance of the Bureaus of Medicine and Surgery and Construction and Repair, and report regularly to the Department the result of all investigations, with recommendations. The Bureau of Medicine and Surgery should also be represented on the Board of Construction, and a medical officer detailed for duty on Inspecting Board.

REVISION OF THE SUPPLY TABLE AND OF THE BOOK OF INSTRUCTIONS FOR MEDICAL OFFICERS.

The supply table of the Medical Department of the Navy is now undergoing revision.

As advances are made in medical knowledge new drugs become known, new appliances devised, and old ones discarded or improved.

It is exceedingly desirable that the supply table should represent, in a compact and convenient form, all the best material known for the prevention and detection of disease, the speedy relief of suffering, and the restoration to health and usefulness of the sick of the Navy. Its frequent and careful revision is thus as essential as its educational power is important. When its revision is completed it will embrace a liberal allowance of medical and surgical supplies, prepared so as to meet the wants of every emergency. Although special requisitions for articles not on the allowance table will be approved, in every case they must be accompanied with an explanation for the necessity of each article required.

The book of instructions for medical officers should also be revised at an early date, to meet the changed and changing conditions of the service and to be in accord with the experience of the seven years since its publication.

It is the desire of the Bureau to have a board of medical officers detailed as soon as practicable for this important work, that there may be greater uniformity and exactness in the performance of medical duties, afloat and ashore.

VACANCIES IN THE MEDICAL CORPS—EXAMINATION FOR ADMISSION.

There are at present six vacancies in the Medical Corps of the Navy.

The selection of candidates for admission as assistant surgeons into the Medical Corps of the Navy is a matter which demands, and is receiving, the earnest consideration of the Bureau, and calls for the exercise of the greatest discrimination by those intrusted with the performance of this important duty.

The efficiency of its personnel, as well as the interests of the service, renders it desirable that candidates presenting themselves for entrance into the corps should be subjected to such an examination as will demonstrate their fitness for the position which they seek, and to whose skill and professional care the lives of the officers and men of the Navy can be, with safety, intrusted.

The Surgeon-General, in his report for 1892, announced his intention of revising and elevating the standard for admission into the Medical Corps of the Navy. This has been done, and the necessary instructions have been transmitted to the president of the naval medical examining boards, with directions that they go into effect from September 1, 1893.

For admission a liberal education is considered a prerequisite, and therefore the literary and scientific acquirements of the candidate must be demonstrated to the satisfaction of the board before proceeding with his professional examination.

The examination is not unreasonably difficult, and the requirements exacted are only intended to correspond with the advances recently made in all branches of professional knowledge and kindred sciences.

MEDICAL OFFICERS ON SPECIAL DUTY AS ATTENDING SURGEONS.

It has been the custom of the Bureau, for many years past, to detail officers of the Medical Corps of the Navy as attending surgeons on officers of the Navy and Marine Corps who are on duty in the various cities on the Atlantic and Pacific coasts.

This very important duty serves two useful purposes, in that it enables officers to secure medical attendance for themselves when sick or injured, without cost, and it also enables the medical officers so detailed to take advantage of their presence in the great cities, which are, as a rule, medical centers, to come in contact with the most advanced medical teachers of the present day.

The practice of medicine on board of naval vessels is necessarily restricted, in that the personnel is composed practically of adults and the range of disease somewhat limited in conseqence. It is also a fact that life on board a vessel of war is so full of interruptions of all kinds, often unavoidable, and the living space so necessarily contracted that continuous and close study is well-nigh impossible. It is therefore readily understood how advantageous to the naval medical officer a detail of this kind is after a period of sea service, which usually is of three years' duration.

The medical officers so detailed frequently ally themselves with civil practitioners in hospital and private practice, and not only engage in general medical and surgical work, but often take up and become experts in the various specialties, such as ophthalmology, otology, laryngology, diseases of women, children, etc.

The importance of encouraging medical officers to engage in such special work, and of detailing as many as possible for duty of this kind, can not be too strongly urged.

The value of such advanced and broadening studies to the medical officers themselves, and to the officers and men under their professional care, can not be overestimated.

The Bureau now has officers on this duty in Washington, D. C.; Norfolk, Va.; Philadelphia, Pa.; New York and Brooklyn, N. Y.; Portsmouth, N. H., and San Francisco, Cal.

NAVY PENSIONS.

The work connected with this important branch of the Bureau is increasing, and it is becoming a difficult problem, with the small force available for this duty, to answer promptly the large number of calls from the Bureau of Pensions.

During the fiscal year ended June 30, 1893, replies in 1,234 cases were furnished the Bureau of Pensions. As the value of such reports depends upon the accuracy with which the records are examined, it is a matter of the greatest importance to have the journals carefully searched, and the data properly prepared. With the force at hand, it is almost impossible to keep the correspondence up to date.

Since July 1, 1893, 823 calls have been received from the Bureau of Pensions. The number of cases received so far during the present fiscal year gives a daily average of more than double the number received last year. It is believed that recent legislation, such as the act of June 27, 1890, will continue to increase the number of cases.

AMERICAN MEDICAL ASSOCIATION—AMERICAN PUBLIC HEALTH ASSOCIATION—ASSOCIATION OF MILITARY SURGEONS OF THE NATIONAL GUARD OF THE UNITED STATES.

It has been the custom of the Department for years to order one or more officers as delegates to represent the Medical Corps of the Navy at the annual meetings of the several associations mentioned.

While it is desirable, under certain requirements, to have the Medical Corps of the Navy represented, the present system is disapproved, and it is suggested for the future, unless the presidents of said associations make direct application to the Department for representation, that the practice be discontinued, and when request is made and granted that the delegates detailed by the Department be required to prepare papers for discussion at the meeting on interesting naval subjects, to notify the Department of the nature of the subjects chosen, and, after adjournment of the meeting, to submit reports in full of the contents of the papers presented and any points of interest developed during their discussion.

ELEVENTH INTERNATIONAL MEDICAL CONGRESS AT ROME, ITALY.

In compliance with a request of the Italian Government, dated October 26, 1892, forwarded through the minister of state to the Navy Department, for a delegate to represent the Medical Corps of the Navy at the Eleventh International Medical Congress, Medical Director Richard C. Dean, of the U. S. Navy, was appointed, and was ordered on the 2d of June, 1893, as naval medical delegate, to attend the meeting of the congress to be held in Rome from September 24 to October 1, 1893. He was also requested to prepare and submit to the Congress for discussion a paper on "The subsistence of armed forces at sea, as illustrated by the analysis of the navy ration of the United States."

On August 4, 1893, the State Department was notified through the Italian minister at Washington that the meeting of the Eleventh International Medical Congress had been postponed until April, 1894, on account of the appearance of cholera at Rome and other Italian cities.

Upon receipt of this information at the Navy Department, Medical Director Dean was ordered to return to the United States upon the completion of the other duties assigned him. His report upon naval and military hospitals, naval medical schools, etc., has not yet been submitted to the Department.

PAN-AMERICAN MEDICAL CONGRESS.

The meeting of this congress was held in Washington, D. C., on the 5th, 6th, 7th, and 8th of September, 1893, under the auspices of the United States Government, act approved July 18, 1892.

In pursuance of the said act, invitations were extended by the Executive to the governments named to send official delegates; and representatives were present from the Argentine Republic, Bolivia, British West Indies, British North America, Chili, Costa Rica, Dominican Republic, Ecuador, French West Indies, Guatemala, Haiti, Hawaii, Honduras (Spanish), Mexico, Nicaragua, Paraguay, Peru, Republic of Colombia, Salvador, Spanish West Indies, United States of Brazil, Uruguay, Venezuela.

The congress met the expectations of all concerned. The Navy Department aided in its success both socially and professionally. The Marine Band was placed at the disposal of the secretary of the congress, and the following officers were ordered to represent the Medical Department of the Navy: Medical Director A. C. Gorgas, Surg. C. A. Siegfried, Surg. H. G. Beyer, and Passed Assistant Surgeon D. M. Guiteras.

INTERNATIONAL CONGRESS OF CHARITIES, CORRECTION, AND PHILANTHROPY.

This international congress met in the city of Chicago on June 12, 1893. The object was to bring together interested persons of all countries to discuss matters charitable, correctional, and philanthropic. The governments of foreign countries, of the United States of America, and of the individual States of the United States, together with scientific societies, official bodies, and corporations, and societies controlling charitable institutions, were invited to send representatives to this congress.

Passed Assistant Surg. J. D. Gatewood, U. S. Navy, was detailed by the Bureau to prepare a report on the "Hospital care of the sick, the training of nurses, temporary work, and first aid to the injured."

TRAINING SCHOOL FOR NURSES.

There will never be an efficient medical department on board ship, or an efficient hospital organization until the entire existing system of appointing baymen and nurses without the necessary qualifications to intelligently perform their duties is abolished.

Sick quarters on board ship and hospitals on shore are places for the treatment of sick, and only those trained and educated especially to do that work should be employed. Every modern hospital at the present day has its training school for nurses, and such training should be started at once at the naval hospital, New York, and as soon as the system and mode of instruction is satisfactorily established to be introduced into all our large naval hospitals.

By such a course the medical department of the Navy would soon be provided with a corps of professional nurses or baymen ready for detail for service on board seagoing ships, and for duty at the several naval hospitals throughout the United States.

As this necessary reform will involve no extra expense to the Government, and could be accomplished by order of the Department under article 827, p. 183, of the Navy Regulations, it is strongly recommended that permission be given to enlist 12 men with the rating of baymen apprentices, to serve for three years, with privilege of reënlisting with rate of baymen; that these men be recruited at the naval hospital, New York, and enlisted under such rules and regulations as may be prescribed; that they be men not under 21 years of age, of good character and intelligence, and capable of pursuing a thorough course of hospital training; that their services be utilized at the hospitals as nurses while undergoing instruction, and when perfectly familiar with all their responsible duties, drafted for service on board ship or duty at other hospitals. Men now employed in hospitals as nurses should be retained if willing to enlist and undergo the course of instruction prescribed.

By a circular letter recently addressed to medical officers in charge of hospitals at the principal naval stations, they were requested to inform the Bureau on the following points:

1. Whether the nurses at the hospitals under their charge had any previous training for the duty before appointment.
2. If they considered them perfectly qualified for their duties.
3. And their efficiency, as compared with the trained nurses employed in the large civil hospitals of Boston, New York, and Philadelphia.

An examination of the reports received from the several naval hospitals in reply to the Bureau's inquiry, shows clearly that:

(1) Few of the men employed as nurses have had previous training or experience in their duties.

(2) With few exceptions, they are not efficient and qualified for their duties.

(3) They do not compare favorably with the trained nurses in large civil hospitals.

If the service in our naval hospitals, so far as it relates to nursing, is to be placed on an equal footing with that of similar establishments of the country, measures should be adopted at once towards improving the present status of hospital attendants.

Under the present system of appointments, there is no uniform standard by which qualifications of the candidate for position of nurse can be determined, nor is it to be expected that a better class of men will be secured or better results attained until some plan is instituted by which they can be properly prepared and fitted for the intelligent performance of the duties associated with the position.

This question of introducing into the service a better class of men, and of properly fitting them by a systematic course of training for the responsible position as nurses in our hospitals and on board of our ships, has suggested itself frequently to those who have given the subject the least consideration, or who are in any way familiar with the method usually followed in obtaining them.

Under the present plan of organization, as soon as a ship is placed in commission one or two landsmen are selected from among the members of the crew and sent down to the sick bay to begin their duties as baymen.

It is hardly necessary to state that the services rendered by such a class of men, without previous knowledge or training as nurses and with no adaptability for such duties, are unreliable.

The following classification of baymen, with pay of each grade, is recommended:

	Per month.
Apprentices	$18.00
Second-class	22.00
First-class	25.00

Regulations determining promotion to be based on length of service and adaptability for their duties.

The aim of such instruction would be to furnish them with a thorough medical and surgical training, to give them the advantages of lectures, demonstrations, ambulance work, and practical experience, and, above all, have them interested in their work, which makes the helpful and successful nurse.

SANITARY REPORTS.

The lack of uniformity and comprehensiveness in the sanitary reports of medical officers has impressed the Bureau with the necessity of introducing some system which will secure greater accuracy in their preparation, and to accomplish this result, instructions covering the subject will be issued at an early date.

NAVAL MEDICAL ATTACHÉS.

As medical officers of the Navy necessarily lose professionally during a cruise of three years at sea, it is deemed advisable, in this age of advancement in the science of medicine and surgery, both in Europe and this country, to give them opportunities for special study and research aside from those available while on duty at the different naval stations in the United States.

The appointment or detail of officers to serve as naval medical attachés at the legations of London, Paris, and Berlin, the principal medical centers of the world, is therefore recommended, as it will add greatly to the professional efficiency of the medical corps of the Navy, and consequently be of benefit to the profession and service at large.

These officers, aside from rendering professional service to the resident members of the embassy, could be required by the Department to visit regularly and report upon the construction and ventilation of hospitals, asylums, and prisons at the cities named, to report as to their water supply, drainage, and sewerage, and manufactures inimical to health. To make themselves familiar with all public health laws and regulations, and all matters relating to causes, progress, and prevention of epidemics; to pay particular attention to the study of bacteriology, and of cases and operations of professional interest in every special branch of medicine and surgery.

There is no duty on shore that could be employed more profitably by a naval medical man, and no duty that would so perfectly qualify him for practical naval hospital service, for duty on medical examining boards, and for special work in connection with the naval laboratory and department of instruction. The detail would also be advantageous and economical by preventing the necessity of sending officers from the United States, when complying with the request of foreign Governments for delegates to represent the Medical Corps of the Navy at international medical congresses and other scientific meetings in Europe.

THE MEDICAL CORPS OF THE NAVY.

Legislation is requested to place this branch of the service on the same basis, regarding rank and position, as has already been granted by Congress to the Medical Corps of the Army.

Professional men in the Medical Corps of the Navy, serving in an established, recognized service like the Army, should at least enjoy the same privileges of rank and title.

By reason of unwise regulations and laws the Medical Corps of the Navy has never received the recognition it is entitled to, although composed of officers of the highest professional standing and educational training.

During the many years prior to the law of 1870, and since then, medical officers of the Navy have borne only obsolete titles and a quasi rank that should never be permitted in a military service.

While the status of the Medical Corps of the Army has been clearly defined by law, and with an established rank, perfectly satisfactory to that branch of the service, nothing has been done for an exactly similar corps in the Navy.

The reason for this can only be explained by the existing differences between the two services.

The Army, by its organization, service, and discipline, is thoroughly harmonious, while the Navy is not, and this has arisen from adopting traditions in the American Navy which should not exist, and in which officers of equal rank, of whatever corps, should be on the same plane of equality.

In the personnel of the Army there is no loss of efficiency or conflict of authority, due to positive rank being conferred on all officers.

The continuance of this distinction in the personnel of the Navy, so destructive to the interests and efficiency of the service, must necessarily continue until obliterated by Congressional action.

Such action, it is hoped, will be recommended and enacted at an early date.

When it is taken into consideration that at the close of the war not an officer of the Medical Corps of the Navy received the slightest recognition for his services, while like service, based on war record, in the Medical Corps of the Army received immediate acknowledgment, and while many officers of the line of the Navy received promotion for war service, it can hardly be considered out of place at this late date, with the growth of the Navy, the Government, and the advancement of modern ideas and times, to represent the wants and requirements of the Medical Corps of the Navy.

The basis of changes comprises no increase of pay, no increase of numbers, but a just recognition, by suitable and proper titles, accompanied, in each grade, with the positive, absolute, and fixed rank accorded to the Medical Corps of the Army.

The title of Surgeon-General should be changed to Medical Director-General, more appropriate for the Navy, and should constitute a permanent grade, as in the Army, to be promoted by selection and to hold office until retirement by age. This officer should also be chief of Bureau of Medicine and Surgery.

The title of Medical Director should remain unchanged; that of medical inspector to fleet surgeon; surgeon to staff surgeon; passed assistant surgeon, an absurd title, to that of surgeon; assistant surgeon, another uncomplimentary title for a professional man, to surgeon junior grade.

PASSED ASSISTANT SURGEONS TO BE COMMISSIONED AND REQUIRED TO PASS A PHYSICAL AND PROFESSIONAL EXAMINATION PRIOR TO PROMOTION TO THE GRADE OF SURGEON.

Under the law assistant surgeons in the Navy, after three years service, are examined both physically and professionally, and, if found qualified by the examining boards, they are recommended for promotion. When the findings and proceedings of said boards are approved by the President of the United States the medical officers are notified that the naval examining boards, before which they were examined, find them physically, morally, and professionally qualified, and they are recommended for promotion, and addressed officially by the department as passed assistant surgeons.

According to the present interpretation of existing laws, passed assistant surgeons are not commissioned and not required to pass the usual physical and professional examinations prior to their promotion to the grade of surgeon. This interpretation is most harmful to the Medical Corps of the Navy and to the service at large.

Passed assistant surgeons remain in that grade for a period of not less than fifteen years, and then without either physical or professional examination, are promoted to surgeon, where they remain fully as long before they are examined physically and professionally for the grade of medical inspector. Thus an assistant surgeon after three years, when he is examined and found qualified for a passed assistant surgeon, is not examined again for a term of twenty-five or thirty years. By following out this rule, which construction of the law demands, there is no way of determining either the physical or professional qualifications of passed assistant surgeons before their promotion to the grade of surgeon.

It is therefore recommended that immediate legislative action be taken in the matter, and that all assistant surgeons, when examined and found qualified for promotion to the grade of passed assistant, be commissioned in that grade, and required to pass both a physical and professional examination prior to promotion to the grade of surgeon, such examination to take place six months after the passage of the law.

EXTENSION OF SICK QUARTERS AT NAVAL STATION, NEW YORK.

The Naval Hospital, New York, increases daily in importance as the Navy gathers strength and the navy-yard near by becomes more and more the center of greater activity in construction and repair.

It is situated in the city of Brooklyn, in the State of New York, and, facing the west, overlooks the navy-yard, half a mile distant and separated from it by a narrow intervening strip of the city.

The grounds, before the Government granted the sale of 2.56 acres to the city of Brooklyn, were enclosed by high brick walls, and purchased by the Government for hospital purposes, on May 1, 1824, for the sum of $7,650; and on April 19, 1833, the State of New York ceded to the United States its jurisdiction over the property.

The sick of the Navy were at once provided for by temporary structures. In 1838 the main portion of the present hospital was built, and in 1840 the wings were added and the original plan completed.

At that time, over fifty years ago, it fulfilled the requirements of the service, providing accommodation for 105 sick and wounded officers and men, viz, 98 men and 7 officers, and with an air space considered ample in those days.

The outbreak of the war revealed the necessity of immediate extension of sick quarters in order to provide for the sick and wounded, and a large three-storied wooden building was erected, increasing the capacity of the hospital by 270 extra beds. With this addition the wards were kept constantly crowded, and the necessity for increased accommodation for the sick existed at this station until long after the war. Even when it became necessary to remove the temporary wooden wards, that had become unsuited for further treatment of the sick, the present hospital buildings were considered inadequate to meet all the demands of the service, and are so considered to-day, but with the fact so pronounced that some immediate action must be taken in the matter to provide for the sick of the Navy on the station, and to be prepared for ordinary emergencies liable to arise at any time.

The necessity for such enlargement was more fully realized at the commencement of the summer, when the rumors and dangers of an advent of cholera threatened the country. Had such an epidemic occurred, with a hospital situated at our principal commercial center and at present not large enough to meet the daily requirements of the station, unusual suffering and exposure and consequent increased mortality would have been the result.

The following facts and figures will probably demonstrate more clearly the necessity for legislative action:

The greatest complement that can be treated in the hospital with safety, as before stated, is 105, allowing accommodations for 98 men and only 7 officers.

The limit of capacity for officers is constantly reached, obliging extemporaneous accommodations by screen, etc., which should not be allowed.

The cubic air space of wards used for the care and treatment of sailors and marines is 118,580 cubic feet, an allowance of only 1,210 cubic feet of air space per man.

Every well equipped modern hospital at the present day provides 4,500 cubic feet per head per hour for sick men, and the minimum of fresh air for hospitals should exceed that required in health by at least one-fourth.

In serious cases of disease the supply should be practically unlimited, as it is a well known fact when such is not the case that disease is often contracted by patients undergoing treatment in hospital for ordinary complaints, and life sacrificed, while by proper allowance of air space and ventilation it could be prevented.

The necessity for unlimited supply of fresh air is one of the most important points to be considered in hospital construction, but has not been followed in the establishment under consideration.

The other defects that can be cited without number as existing at present at this hospital and requiring immediate attention are as follows:

Bad floors, some of them rotton and uneven, bad ceilings, walls of ordinary plastering and poisoned by germs of disease, no serviceable ventilation, bad plumbing, and a defective system of heating, besides a poorly-fitted kitchen, located in the basement, that should be removed at once.

During the last fiscal year there were 4,409 officers, sailors, and marines at the New York station from time to time entitled to hospital treatment. The yard was visited by 21 seagoing ships needing repairs, carrying a combined complement of 3,760 officers and men, and remaining at the yard from 1 to 394 days.

Of the larger vessels, the *Baltimore*, with a complement of 350, was there for 134 days; the *Chicago*, with a complement of 381, for 64 days; the *San Francisco*, with a complement 350, for 54 days, and the *Philadelphia*, with a complement of 350, at the yard 32 days.

The following tabulated statement gives names of vessels, complement, and number of days at navy-yard for fiscal year ending June 30, 1893:

Vessel.	Complement.	Time at yard.	Vessel.	Complement.	Time at yard.
		Days.			*Days.*
Atlanta	250	99	Kearsarge	220	3
Baltimore	350	134	Miantonomoh	150	394
Bancroft	129	45	Monongahela	399	29
Bennington	195	71	Philadelphia	350	32
Blake	40	12	Portsmouth	250	14
Chicago	381	64	San Francisco	350	54
Concord	195	1	Stiletto	7	8
Cushing	24	64	Vesuvius	70	154
Dolphin	115	53	Yorktown	195	102
Endeavor	20	21			
Fern	38	62	Total	3,760	1,441
Fortune	32	25			

The above table does not include the permanent force on the station, varying very little from year to year, viz: officers attached to yard, those on special duty in New York and vicinity; the receiving ship *Vermont*, with an average complement of 447 officers and men, the marine barracks, with a yearly average of 202, and the training ship *Minnesota*, 106; and the officers and men attached to naval and Coast Survey vessels, frequently in the port of New York without visiting the navy-yard, but entitled, nevertheless, to hospital care and treatment on the station.

During the months of April, May, and June of this year, there were in the harbor of New York 349 officers of our own service, and probably more than twice that number belonging to the different foreign services of the world.

It has always been the custom to extend the privileges of hospital treatment to officers and men of foreign navies when they are in the port of New York, returning a like courtesy extended to American officers and sailors when abroad.

Had anything unusual occurred in the health of our own and foreign squadrons during the recent naval review at New York, we would have not only been found unprovided with accommodations for our own sick, but obliged to suffer the mortification of being utterly unable to look out for the sick of the several foreign fleets represented.

The arguments advanced seem to carry conclusive evidence that immediate steps should be taken to extend, renovate, and repair the U. S. Naval Hospital, Brooklyn, N. Y., so that it can not only compare with the modern hospitals of the day, in construction, sanitary fittings, and ventilation, but be equal or superior to civil hospitals in all our large cities and military hospitals abroad.

To accomplish this no special appropriation will have to be made, as the amount derived from the sale of 2.56 acres of the hospital property to the city of Brooklyn in 1890, and placed to the credit of naval hospital fund is at the disposal of Congress, and of sufficient amount to make the needful hospital extension and improvements now required at the naval station, New York.

It is therefore requested that legislative action be taken, granting authority to the honorable Secretary of the Navy to use as much of the appropriation "Naval Hospital Fund" accruing from the recent sale of hospital grounds to the city of Brooklyn, and turned into that fund, as may be required to thoroughly repair said hospital, and to build, equip, and maintain additional sick quarters of modern construction, commensurate with the requirements of the service and naval station, New York, for the proper care and treatment of sick and wounded officers and men of the Navy, provided the amount required shall depend upon the lowest estimates made under contract to do the work suggested, and not to exceed the special fund referred to obtained by sale of hospital land.

The health of the Navy, as will be seen by reference to the statistical tables, has been most favorable for the year 1892.

In submitting this report for the consideration of the Department, I have to state that more facts and figures than usual have had to be presented in detail, in order to properly explain the several existing conditions and wants of the medical department of the Navy, and the legislation required to place it on an efficient basis, clearly needed and consistently demanded for the improvement of the service.

Very respectfully,

J. R. TRYON,
Surgeon-General, U. S. Navy.

Hon. H. A. HERBERT,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Bureau of Medicine and Surgery, Navy Department.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
SALARIES.			
Chief clerk (appropriated act of Mar. 3, 1893)	$1,800.00		
One clerk of class 3 (same act)	1,600.00		
Two clerks of class 2 (same act)	2,800.00		
Two clerks of class 1 (same act)	2,400.00		
One clerk (same act)	1,000.00		
One assistant messenger (same act)	720.00		
One laborer (same act)	660.00		
One janitor for naval dispensary (same act)	600.00		
One laborer for naval dispensary (same act)	480.00		
		$12,060.00	$12,060.00
MEDICAL DEPARTMENT.			
For surgeons' necessaries for vessels in commission, navy-yards, naval stations, Marine Corps, and Coast Survey, and for the civil establishment at the several naval hospitals, navy-yards, naval laboratory and department of instruction, museum of hygiene, and Naval Academy. (Appropriated, act of Mar. 3, 1893.)		60,000.00	60,000.00
NAVAL HOSPITAL FUND.			
For maintenance of the naval hospitals at the various navy-yards and stations, and for care and maintenance of patients in other hospitals at home and abroad. (Appropriated, act of Mar. 3, 1893.)		20,000.00	20,000.00
CONTINGENT.			
For freight, expressage on medical stores, tolls, ferriages, transportation of sick to hospital, transportation of insane patients; care, transportation, and burial of the dead; advertising; telegraphing; rent of telephones; purchase of books and stationery; binding of medical records, unbound books, and pamphlets; postage and purchase of stamps for foreign service; expenses attending the medical board of examiners; rent of rooms for naval dispensary and museum of hygiene; hygienic and sanitary investigation and illustration; sanitary and hygienic instruction; purchase and repair of wagons and harness; purchase of and feed for horses and cows; trees, plants, garden tools, and seeds; furniture and incidental articles for the museum of hygiene, naval dispensary, Washington, naval laboratory, sick quarters at Naval Academy and marine barracks, surgeons' offices and dispensaries at navy-yards and naval stations; washing for medical department at museum of hygiene, naval dispensary, Washington; naval laboratory and department of instruction, sick quarters at Naval Academy and marine barracks, dispensaries at navy-yards and naval stations, and ships, and rendezvous, and all other necessary contingent expenses. (Appropriated, act of Mar. 3, 1893.)		25,000.00	25,000.00
MEMORANDUM.—Under the above appropriation for the fiscal year ending June 30, 1895, the words "medical records" are inserted, and which do not appear in this appropriation for the year ending June 30, 1894.			
REPAIRS.			
For necessary repairs of naval laboratory and department of instruction, naval hospitals and appendages, including roads, wharves, outhouses, sidewalks, fences, gardens, farms and cemeteries. (Appropriated, act of Mar. 3, 1893.)		20,000.00	20,000.00

REPORT

OF THE

COMMANDANT OF THE UNITED STATES MARINE CORPS.

HEADQUARTERS U. S. MARINE CORPS,
Washington, D. C., September 28, 1893.

SIR: I have the honor to submit my annual report of the condition of the U. S. Marine Corps for the past year.

During that time I have made a personal inspection of all the posts except Mare Island and Sitka, and found them in excellent condition with the exception of Brooklyn, where extensive repairs are necessary consequent upon the age of the buildings there, which was made known to the Department in my letter inclosing the annual estimates.

On September 10, 1893, there were 2,093 enlisted men in the corps, only 7 short of the total number appropriated for, which is a better state of affairs than has existed for a long time. The large number of men thrown out of employment by the financial situation is undoubtedly the cause of so many enlistments recently. Of the number mentioned above 1,129 were on duty at the different shore stations and 964 on board ships in commission.

Even with this increased number on shore the men are called upon to perform very severe and confining duty, never having more than two days between guards, and should the present number suffer a reduction they will return to the "day on and day off" routine. Comparison with the duty army troops are required to perform will show that marines are much harder worked and more confined to barracks and consequently given less opportunity for liberty, which necessarily causes dissatisfaction among the men and increases the number of desertions, particularly among those who have not been long enough in the service to become accustomed to the radical change in their lives. Men should never have less than four days off guard, and more if possible, as with the constant drills and target practice, and the varied police duty around garrison, they have plenty to do even while not on guard.

The gradual increase of the Navy by the addition of new ships, a number of the largest of which will probably be placed in commission during the coming year, will cause further drain on the force of marines on shore by the necessity for guards, and to supply them and still maintain a sufficient force at the navy yards to properly protect the vast amount of valuable Government property there imperatively demands a material increase in the number of men allowed the corps by present appropriation.

I have repeatedly stated these facts to the Department in my annual reports and at other times, and again earnestly appeal for the support of the Hon. Secretary of the Navy to urge upon Congress the necessity for appropriating for the following additional men, viz: 10 sergeants, 40 corporals, 12 drummers, 12 fifers, and at least 426 privates, a total of 500 men, as recommended in my letter of June 30, 1893, to the Department, to which attention is respectfully invited, the need for these men being fully explained therein.

The additions mentioned would place the corps on a far more effective footing, and it is believed would be in the nature of economy, as it would then be possible to transfer an entire guard to a vessel about to be placed in commission from the marine barracks to which she is nearest without the many transfers from the different stations that are now made necessary before a guard can be collected. This would of course avoid the necessity for the use of so much money for transportation. The duty on shore would also be better and there would not be so many desertions, and the consequent loss to the Government of clothing would be saved.

In May last I was informed by the Department, in compliance with my request, that eighteen rapid-fire guns would be loaned by the Navy to the Marine Corps as soon as mounts for them were received, for the purpose of instructing marines at the different shore stations in their use preparatory to the men being sent on board ship, but up to this date the guns have not been delivered by the Bureau of Ordnance. If the mounts have been received I respectfully request that the guns be turned over to the Marine Corps at once, as the large number of recruits now at the posts should be instructed during the winter when outdoor drills are impossible and the indoor drills at these guns would be of great benefit to both officers and enlisted men.

I renew my recommendation of last year that the Department issue an order assigning marines on board ship to duty at the secondary battery, as I firmly believe the efficiency of the service will be materially increased thereby.

Quite an impetus to promotion among the first and second lieutenants has been given during the past year owing to retirements, but the stagnation in the grade of captain still remains, and I again urge that some legislation be enacted whereby this may be relieved and these old officers, some of whom have served over and many nearly thirty years, may be promoted to field officers while their period of usefulness and activity remains.

A detachment of three officers and sixty enlisted men, under the command (at different times) of Capts. B. R. Russell and Paul St. C. Murphy, has been on duty at the World's Columbian Exposition at Chicago, being camped in tents on the grounds. These men were selected from the several stations and I am happy to state have conducted themselves with credit to the corps, as evidenced by the constant good reports I have received from there, and by the appended copy of a letter from the Director-General of the Exposition to Capt. Russell, in which he expresses his "profound gratitude for the prompt and heroic service rendered by the marines" during the catastrophe which resulted from the burning of the cold-storage building there.

At Honolulu, during the time of the deposition of the Queen and the installation of the present government, the marine guard of the U. S. S. *Boston*, under the command of First Lieut. H. L. Draper, was sent on shore for the purpose of protecting lives and property there, and it is pleasing to note that this duty was faithfully and efficiently performed and called forth the appended copy of a resolution adopted by the Provisional Government of the Hawaiian Islands and presented to Lieut. Draper. I invite the Department's attention to the request contained in my letter of April 20 last inclosing this resolution, that the Department will recognize the services rendered by the marines on this occasion in such manner as it may deem proper.

At the time of the recent hurricane which visited this coast with such disastrous results to life and property, the marines at the naval station, Port Royal, S. C., performed praiseworthy and efficient service, and the commandant of the station testifies to their conduct in complimentary terms, as appears in the annexed copy of his letter.

It is most gratifying to me to know that wherever marines are stationed, either at home or abroad, they are ever ready for any duty which they may be called upon to perform.

The additional sum of $2,600 asked for in my last report was appropriated by Congress for the construction of the barracks at the naval station, Port Royal, and the contract accordingly awarded to the lowest bidder. The building is now nearing completion and will be ready by November 1, 1893, the contractor having been given an extension of time to that date owing to a setback occasioned by loss during the hurricane. On my recent inspection there I found this barracks to be well built and complete in every way, and it will very much add to the comfort of the men who have been camped in tents.

The adjutant and inspector U. S. Marine Corps, who visited the marine barracks, Sitka, Alaska, in the spring, reports the command and barracks there in excellent condition, and recommends that quarters for officers be erected, as the room in the barracks now used by the commanding officer is unsuitable for the purpose and is moreover required for the use of the enlisted men. I trust the provision for these quarters, which I have directed the quartermaster to include in his annual estimates, may be favorably acted on.

In the event of the sickness of the commanding officer of this detachment, or the necessity for the presence of an officer with a portion of the guard in other parts of the Territory, where trouble is liable to occur at any time, the need for two officers at this post seems apparent, and it is my intention to order another officer there when one can be spared. During the absence of the *Pinta* the marine officer is the only representative of the Navy in Alaska, and occupies a very important and responsible position.

Congress having appropriated $15,000 for the erection of a barracks at the naval training station, Newport, R. I., in compliance with my recommendation, the plans therefor have been prepared and approved by the Department and the contract for its construction has been awarded, and when approved by the Secretary of the Navy work thereon will be commenced at once and actively pushed to completion.

The school of application here has commenced the third year of its existence, and the six second lieutenants appointed in July are now undergoing instruction, together with a new class of non-commissioned officers and privates. The work accomplished at this school has been eminently satisfactory, and the beneficial results are apparent in those who have taken the course. The closing exercises of last year's class were most interesting and showed the thoroughness of the instruction, in both theory and practice. I invited Commander C. M. Thomas, U. S. Navy; Col. Theodore Mosher, U. S. Army; adjutant general of the District of Columbia militia, and Capt. F. L. Denny, A. Q. M., U. S. Marine Corps, to witness these exercises, and a copy of their report to me, which is very gratifying, will be found attached to that of Capt. D. P. Mannix, commanding the school, which is inclosed herewith and I would like to have made a part of this report.

The recommendations made in my report of last year relative to the improvement of the condition of the band of the U. S. Marine Corps, that twelve quartermaster-sergeants be provided for, and that the act providing for the deposits of seamen of the Navy be made applicable to the Marine Corps, are again renewed and presented to the Department with a request for favorable consideration thereon.

By an act of Congress approved March 3, 1893, marines are now permitted to purchase discharge, and this means of honorably securing release from the service before the expiration of enlistment will, it is thought, tend to reduce desertion in the cases of men whose interests in civil life urgently demand the severance of their connection with the corps.

Attention is invited to the fact that the new Navy Regulations fail to provide for a salute for the Commandant of the Marine Corps when he visits navy-yards, stations, or ships in commission on public duty. In accordance with the Department's circular to navy-yards of June 3, 1879, the Commandant of the Marine Corps has always been accorded the same salute as given to the chief of a bureau of the Navy Department, and it seems certainly due to his position as the head of one of the coördinate branches of the military establishment of the Government that he should be received, when making his official visits, with the same honors that are paid to a chief of bureau, who holds relative rank and occupies a temporary position, and I earnestly recommend that the Navy Regulations be so amended that this salute shall be provided for and given as heretofore.

I desire to present, for the consideration of the Department, the fact that the records of the Marine Corps, both of my office and those of the staff, are stored in two buildings, one of brick and the other and larger one of wood, which are liable at any time to be destroyed by fire, originating in them or in buildings outside of the inclosure here, which would in a few minutes obliterate our records since 1798 and thereby cause great loss to the Government.

I deem it my duty to inform the Department of this fact, and request that some provision be made for the erection of a fireproof building here which will be large enough for the accommodation of the Commandant and staff, with their clerks, and all the records. It is thought such a building could be erected for about $25,000.

The Second Comptroller of the Treasury having questioned the propriety of the Department's order of October 5, 1892, directing that the quartermaster pay to the commanding officers of posts, at the end of each month, a sum equivalent to the contract price of the number of rations saved by the latter for their commands, I desire to state that it is my earnest hope that no change in the above-mentioned order will be made, as the men everywhere on shore are better fed and more contented than ever before, and it would be a misfortune should the former system be restored. I fully approve the views expressed by the Acting Commandant in his indorsement of the 9th instant to the Department on this subject.

The usual estimates were forwarded to the Department on July 29 last and returned here on the 23d instant, with directions to reduce the total sum in those of the Paymaster, U. S. Marine Corps, from $717,947.13 to $702,000, which was complied with and they were again forwarded to the Department on the 25th instant. A duplicate set is inclosed herewith.

Since October 1, 1892, there have been 1,014 casualties in the enlisted strength, caused by deaths, discharges, retirements and desertions, and since the same date there have been 1,348 enlistments and reënlistments.

The following retirements have taken place since my last report: Capts. E. P. Meeker, March 15, 1893, on his own application, having served over thirty years; and Robert D. Wainwright, April 17, 1893, H. C. Fisher, March 16, 1893, and L. J. Gulick, April 18, 1893, for disability in the line of duty. The two latter were brought before a board as first lieutenants for examination for promotion to captains and failed to pass physically, and in accordance with law were retired with the rank to which their seniority entitled them to be promoted.

During the same period Lieut. Col. G. W. Collier, Capt. W. S. Schenck, and First Lieut. Jesup Nicholson, all on the retired list, have died, the dates being December 23, 1892, June 4, 1893, and May 22, 1893, respectively.

Very respectfully, your obedient servant,

CHARLES HEYWOOD,
Colonel Commandant.

The SECRETARY OF THE NAVY,
Washington, D. C.

WORLD'S COLUMBIAN COMMISSION,
OFFICE OF THE DIRECTOR-GENERAL OF THE EXPOSITION,
Chicago, Ill., July 12, 1893.

DEAR SIR: You will permit me to express my profound gratitude for the prompt and heroic service which the marines under your command rendered during the awful catastrophe which visited these grounds on Monday, and I would be greatly obliged if you would have this letter read in the hearing of your men.

I have the honor to be, sir, your obedient servant,

GEO. R. DAVIS,
Director-General.

Capt. B. R. RUSSELL, U. S. M. C.,
Camp Herbert, Jackson Park, Chicago, Ill.

Resolved, That the sincere thanks of the executive and advisory councils of the Provisional Government of the Hawaiian Islands be, and they are hereby, tendered to Lieut. Herbert L. Draper, U. S. Marine Corps, and to the men composing the marine guard of the U. S. S. *Boston*, under his command, for efficient, faithful, and valuable services rendered to the Provisional Government while in charge of the Government buildings and grounds at Honolulu from February 1 to April 1, 1893.

During this period the watchful care over valuable Government property, the orderly conduct and discipline maintained by Lieut. Draper and his men are deserving of the highest praise and commendation.

To Lieut. Herbert L. Draper and the officers and men of the U. S. Marine Corps, U. S. S. Boston:

GENTLEMEN: I have the honor hereby to inform you that the above resolution was unanimously passed by the executive and advisory councils of the Provisional Government of the Hawaiian Islands in session this day.

JAMES B. CASTLE,
Secretary of the Executive and Advisory Councils.

HONOLULU, HAWAIIAN ISLANDS, *April 3, 1893.*

COMMANDANT'S OFFICE, U. S. NAVAL STATION,
Port Royal, S. C., September 6, 1893.

SIR: I take pleasure in informing you that during the night of the 27–28 of August, while a cyclone was sweeping over this station and a tidal wave inundated it, the conduct of every man in the marine guard was most praiseworthy. Almost without exception they waded to and fro through the flood of water which was driven by the wind into the seas so dangerous that many people were overthrown and drowned by them, doing their utmost to preserve life and property. The influence of First Sergt. Gallagher, and of the non-commisioned officers, who are all excellent men, has brought the tone of the guard to a most creditable condition.

Respectfully,

L. A. BEARDSLEE,
Captain Commandant.

The COLONEL COMMANDANT U. S. MARINE CORPS,
Washington, D. C.

SCHOOL OF APPLICATION, U. S. MARINE CORPS.

REPORT OF BOARD OF VISITORS.

WASHINGTON, D. C., *April 26, 1893.*

SIR: At your request we, the undersigned, met at the U. S. Marine Barracks, Washington, D. C., on the morning of the 24th instant, to witness the closing exercises and final examination of the officers and non-commissioned officers at the school of application of the class formed September 1, 1892.

Having thoroughly examined into the practical and theoretical working of the school, and witnessed the excellent results achieved by the class which has just completed the prescribed course, it is with great pleasure we submit to you our unanimous opinion that the general plan of the school is deserving of the highest praise and reflects great credit upon the present commanding officer, Capt. D. P. Mannix, U. S. Marine Corps, the first to organize this most thorough course of instruction for the officers and non-commissioned officers of the Marine Corps, and the great value of the final result to the corps must be evident to the most casual observer.

We have been most particularly impressed with the proficiency shown by the members of the class, commissioned and non-commissioned, and the readiness with which the examination questions were answered gave evidence of the thoroughness of preparation, of which the highly creditable practical exercises were an object lesson.

Copies of the questions in detail under the several divisions of the course, viz, 1, infantry; 2, artillery; 3, administration and sea service; 4, law; 5, torpedoes; 6, engineering; 7, military art, were placed at our disposal, and a careful inspection of the examination papers warrants us in stating that the scope of the questions leaves nothing to be desired.

The notes and circulars on professional subjects prepared by the instructors under the direction of the commanding officer of the school of application are of great value, being practically a compendium of the military art up to date, and we respectfully urge that copies of the same be freely issued to officers and non-commissioned officers of the corps afloat and ashore. The seed thus sown will be sure to bring forth good fruit, and will greatly enhance the usefulness of the school of application and bring to the notice of the Navy at large the excellent work that is now being accomplished.

In conclusion, we congratulate the colonel commandant upon the establishment of this school during the early period of his administration, and beg leave to express the hope that it will receive the financial aid of Congress and the earnest support of the Navy and Marine Corps, which it so richly deserves.

Very respectfully,

CHAS. M. THOMAS,
Commander U. S. N.
THEODORE MOSHER,
First Lieutenant, Twenty-second U. S. Infantry, and
Lieutenant-Colonel and Adjutant-General D. C. Militia.
F. L. DENNY,
Captain and A. Q. M., U. S. M. C.

The COLONEL COMMANDANT, U. S. MARINE CORPS,
Washington, D. C.

REPORT OF COMMANDING OFFICER.

HEADQUARTERS SCHOOL OF APPLICATION,
U. S. MARINE CORPS,
Marine Barracks, Washington, D. C., September 15, 1893.

SIR: I have the honor to submit the following report of the School of Application of the U. S. Marine Corps for the year ending September 1, 1893.

On September 1, 1892, the following officers reported for duty at the school, forming the second class for instruction in the commissioned officers' division, viz: Second Lieut. Albertus W. Catlin, U. S. Marine Corps; Second Lieut. Lawrence H. Moses, U. S. Marine Corps; Second Lieut. Wendell C. Neville, U. S. Marine Corps; Second Lieut. Cyrus S. Radford, U. S. Marine Corps; Second Lieut. Thomas C. Treadwell, U. S. Marine Corps.

On September 5, 1892, the organization of the enlisted men's department of the school being completed, a class of non-commissioned officers and privates was formed for instruction in the subjects outlined in the programme for their division.

The prescribed courses of instruction as given in detail in my last annual report of the school and approved by the colonel commandant, was adhered to as closely as possible. This included, in addition to the drills and practical exercises, fifty-nine recitations in the department of infantry—nineteen in the drill regulations, ten in the manual of guard duty, sixteen in small arms firing regulations, and fourteen in infantry fire discipline. In the department of artillery there were twenty two recitations—ten in the drill regulations and twelve in naval gunnery. In administration duties on board ship and regulations there were nineteen lessons and recitations. In law twelve recitations. In the department of torpedoes there were thirty recitations—seventeen in submarine mines, electricity, and fuses, seven on spar torpedoes, and six in explosives.

In the department of engineering there were fifty eight recitations and lectures—eighteen in military engineering, fifteen in military topography, twenty one in signals, theoretical and practical, four on military hygiene and early aid to the injured. In the department of military art there were forty four recitations—nineteen in minor tactics and twenty-five in grand tactics and strategy.

With the permission of Commodore Sampson, chief of the Bureau of Ordnance, the classes visited the ordnance shops at the Washington Navy-yard, and witnessed the important operations in gun construction. They were kindly received by Commander Jewell, inspector of ordnance and by his assistant inspectors, and shown the details of the work in progress and completed, such as the manufacture of modern guns and gun carriages, the heating and assembling of gun hoops and jackets, boring guns and jackets, rifling and sighting guns, the preparation of fuses and primers, different types of breech mechanism, and the details of the various rapid-fire and machine guns, etc. Advantage was taken by the officers' division of Commodore Sampson's permission to visit the naval experimental grounds at Indian Head. The class was politely welcomed by Ensign Dashiell, the officer in charge, and every opportunity afforded and all desired explanation given, that the visit might be productive of practical and theoretical benefit. A good conception of the work being done was gained by the class.

Upon the completion of the course of study a board of officers was assembled on Monday, April 24, to witness the final examination and closing exercises of the class of commissioned and non commissioned officers, and to carefully examine into the actual condition of the school with special reference to its discipline and methods of instruction. The following officers composed the board: Commander Charles M. Thomas, U. S. Navy; Lieut. Col. Theodore Mosher, U. S. Army, adjutant-general District of Columbia Militia; and Capt. Frank L. Denny, U. S. Marine Corps.

Every facility was afforded the board to carry out the duties assigned to it, and its personnel is a guaranty of the thoroughness with which these duties were performed.

Questions had been prepared for the final written examination [illegible] course in each division of the school and submitted to the board. [illegible] understanding of the work done at the school during the last year [illegible] of these questions [illegible]

The board expressed great satisfaction at the proficiency of the [illegible] commissioned officers of the graduating class. [illegible] its appreciation of the system of instruction pursued [illegible] progress made by [illegible]

The class of officers and non-commissioned officers [illegible] course the most intelligent [illegible] final standing of each member [illegible]

OFFICERS' DIVISION.

	General average.		General average.
	Per cent.		*Per cent.*
1. Lieut. Catlin	94.1	4. Lieut. Radford	88.3
2. Lieut. Neville	93.4	5. Lieut. Moses	83.5
3. Lieut. Treadwell	89.7		

NON-COMMISSIONED OFFICERS' DIVISION.

1. Sergt. Donovan	93.7	8. Sergt. Roberts	87.0
2. Sergt. O'Brien	92.6	9. Sergt. Stephens	83.9
3. Sergt. Prentice	91.6	10. Corpl. Conner	83.3
4. Corpl. Wagner	90.8	11. Corpl. Mays	82.4
5. Sergt. Gillies	87.8	12. Corpl. Wetzler	73.0
6. Corpl. Goeltz	87.5	13. Corpl. Carroll	72.1
7. Corpl. O'Connor	87.2		

While officers and non-commissioned officers acquitted themselves well, yet there should be greater incentives to study.

The officers, it is true, see before them the determination of the Government to retain in its service only those who show themselves physically, mentally, morally, and professionally qualified to perform efficiently all the duties required of them, and the importance of the course of study here has been increased to the extent of exempting the graduates of the school for three years from a severe examination for promotion in every branch of study pursued here. But, for the non-commissioned officers, there is little or no incentive beyond the mere desire on the part of individuals to take advantage of the opportunities for improvement offered them. An increase of the non-commissioned staff of the corps, vacancies to be filled by selection from the graduates of this school, or an increase of their monthly pay, would be some incentive; but as both of these measures necessitate legislation by Congress, I would recommend that in the meantime the colonel commandant award all non-commissioned graduates of the school, including privates, obtaining a general average of 85 per cent during the year, a small distinctive badge of material and design suitable to be worn on the collar of the coat with authority by general order to so wear it upon all occasions, either on or off duty.

I would also recommend that prizes be awarded for deportment and scholarship in the apprentice school to those who attain a general average of 85 per cent throughout the year.

The course in this school is designed to prepare boys for the positions of drummers and buglers in the corps.

Boys are received between the ages of 14 and 16, and enlisted with the consent of their parents or guardians, to serve in the Marine Corps until reaching their majority.

They are instructed in music, and are also given the rudiments of an English education, including reading, spelling, composition, penmanship, arithmetic, grammar, history, and geography.

They have a daily drill, Saturdays and Sundays excepted, from 6:50 to 7:15 a. m.; musical instruction, theoretical and practical, from 9:30 to 11:30 a. m., and 1:15 to 2:15 p. m.; English branches from 2:30 to 4:30, and from 6:30 to 7:30 p. m.

Their attendance is also required at all roll-calls and inspections, including guard mount and parades.

The apprentice class averaged 28 boys (rated and un-rated) in attendance during the past year, and the annual examination on June 30 last gave evidence of their industry and of the zeal and intelligence with which their instructors performed their duties.

Progress in all instruction at the post has been exceedingly satisfactory and gratifying. Dr. Dickson, in addition to his regular duties, rendered most valuable services to the officers and enlisted men by his interesting lectures on military hygiene and early aid to the injured.

I have great pleasure in saying that, in Lieuts. White, Prince, and Long, I have had most able and energetic assistants. Lieut. Prince was detached for sea service on March 18, before the end of the school term, and Lieut. Long was detached on May 9.

Lieut. Neville, of the last class, remains here as instructor in the non-commissioned officers' division.

The school of application has been in existence two years, and while there are many necessities and much to be done I am able to report to the colonel commandant that rapid progress in usefulness has been made.

The course has been divided into recitations, drills, and practical exercises, covering a period of seven months. When the class can remain at the school for a term of eight months, as the last class did with great advantage, the additional month is devoted to practical field work.

The following schedule* shows how the time is apportioned to the several branches of instruction.

Respectfully submitted.

D. PRATT MANNIX,
Captain, U. S. Marine Corps, Commanding.

The COLONEL COMMANDANT U. S. MARINE CORPS.

HEADQUARTERS U. S. MARINE CORPS,
Washington, D. C., July 29, 1893.

SIR: I inclose herewith for your approval the usual estimates for the support of the U. S. Marine Corps for the fiscal year ending June 30, 1895.

In addition to these I have included in those of the Quartermaster the sum of $2,500 for the erection of suitable officers' quarters at the marine barracks, Sitka, Alaska. This is made necessary in order that that part of the enlisted men's quarters, now occupied by the officer in command there, may be restored to its legitimate use, as the space is much needed.

Under "repair of barracks" a specific appropriation of $5,000 is asked for, that the marine barracks at Brooklyn, N. Y., and other public buildings there may be placed in repair; also the gas and water pipes, as recommended by different boards of survey on file in the office of the Quartermaster U. S. Marine Corps. As the general estimate of $10,000 for repair of barracks will not admit of performing this work the sum above named is absolutely necessary.

The Quartermaster U. S. Marine Corps, in his letter of the 28th instant, explains the necessity for an increase of $5,000 in the appropriation for clothing, and I hope this sum will be allowed to stand, as it is urgently requried, there being nothing that causes as much complaint as the insufficient supply of clothing, which is entirely due to the lack of a large enough sum with which to manufacture it.

I have again included in those of the Paymaster an increase of pay for the chief clerks of the Quartermaster's, Adjutant and Inspector's, and my own office to correspond with that allowed the chief clerk of the Paymaster. These amounts are very small, and I trust they may be granted, as the men who occupy these positions are very deserving, and there is no reason why they should be discriminated against in favor of the paymaster's clerk.

I desire to invite the Department's attention to the fact that, notwithstanding the additions to the Quartermaster's and Paymaster's estimates (those in the latter's being made necessary by recent legislation, increasing the pay of first sergeants and sergeants) the total sum required for the support of the U. S. Marine Corps for the coming fiscal year is over $3,100 less than that estimated for last year.

Very respectfully, your obedient servant,

CHARLES HEYWOOD,
Colonel Commandant.

The Honorable the SECRETARY OF THE NAVY,
Washington, D. C.

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*Omitted.

Estimates, Paymaster Marine Corps.

HEADQUARTERS U. S. MARINE CORPS,
PAYMASTER'S OFFICE,
Washington, D. C., July 25, 1893.

SIR: I respectfully submit herewith estimates for the pay of officers, non-commissioned officers, musicians and privates, and of civil force of the U. S. Marine Corps for the fiscal year ending June 30, 1895.

These estimates show an increase of $4,477.50 over the estimates for the present fiscal year, viz:

Pay of officers on the retired list, increase	$997.50
Pay of enlisted men, increase	3,480.00
Total increase	4,477.50

The latter increase is rendered necessary owing to increased pay of first sergeants and sergeants authorized by act of Congress approved February 27, 1893.

The difference between amount appropriated for current fiscal year and amount estimated as necessary for fiscal year ending June 30, 1895, is $21,468.77, which is thus explained:

Estimated pay of officers on the retired list, 1895	$56,865.00
Appropriated pay of officers on the retired list, 1894	52,867.50
Difference	3.997.50
Estimated pay of enlisted men on active list, 1895	400,741.92
Appropriated pay of enlisted men on active list, 1894	385,000.00
Difference	15,741.92
Estimated pay for undrawn clothing, 1895	25,000.00
Appropriated pay for undrawn clothing, 1894	21,000.00
Difference	4,000.00
Estimate for payment of commutation of quarters, 1895	4,550.00
Appropriation for payment of commutation of quarters, 1894	4,000.00
Difference	550.00
Estimated pay of civil force, 1895	17,815.58
Appropriated pay of civil force, 1894	17,636.23
Difference	179.35

Very respectfully,

GREEN CLAY GOODLOE,
Major and Paymaster, U. S. Marine Corps.

The COLONEL COMMANDANT, U. S. MARINE CORPS,
Headquarters.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Paymaster of the U. S. Marine Corps.

Detailed objects of expenditure and explanations.		Estimated amount which will be required for each detailed object of expenditure.
PAY OF MARINE CORPS.		
Pay of officers on the active list:		
1 colonel commandant, 1 colonel, 2 lieutenant-colonels, 1 adjutant and inspector, 1 paymaster, 1 quartermaster, 4 majors, 2 assistant quartermasters, 20 captains, 30 first lieutenants, and 12 second lieutenants		$179,320.00
Pay of officers on the retired list:		
4 colonels, 2 lieutenant-colonels, 1 major, 1 quartermaster, 1 assistant quartermaster, 12 captains, 2 first lieutenants, and 3 second lieutenants		56,865.00
Pay of non-commissioned officers, musicians, and privates:		
1 sergeant-major, 1 quartermaster-sergeant, 1 leader of the band, 1 drum-major, 50 first sergeants, 140 sergeants, 180 corporals, 30 musicians, 96 drummers and fifers, and 1,600 privates, and for the expenses of clerks of the U. S. Marine Corps traveling under orders	(R.S., p.272, sec.1596, p.220, sec.1623; act June 30, 1834, vol. 4, p. 713, secs. 4, 5; act March 2, 1847, vol. 9, p. 155, sec. 3; act Aug. 5, 1854, vol. 10, p. 586, sec. 1; act Feb. 21, 1857, vol. 11, p. 163, sec. 1; act July 17, 1862, vol. 12, p. 594, sec. 2; act June 30, 1864, vol. 13, p. 144, sec. 1; act Mar. 3, 1865, vol. 13, p. 487, sec. 1; act July 28, 1866, vol. 14, p. 334, sec. 13; act Mar. 2, 1867, vol. 14, p. 122, sec. 1; act Mar. 2, 1867, vol. 14, p. 517, sec. 7; act July 15, 1870, vol. 16, p. 330, sec. 3; act Jan. 30, 1885, vol. 23, p. 293, 4, sec. 1; act Feb. 14, 1885, vol. 23, p. 305, sec. 1; Navy Regulations, July 18, 1816; act July 19, 1892, vol 27, p. 245 sec. 1.)	384,794.79
NOTE.—" * * * and for the expenses of clerks of the U. S. Marine Corps traveling under orders." These words were added to enable the Second Comptroller to authorize reimbursement of amounts expended by clerks traveling under orders; to be paid out of any unexpended balance of "Pay of the Marine Corps."		
Pay of retired enlisted men:		
1 sergeant-major, 1 drum-major, 3 first class musicians, 5 first sergeants, 16 sergeants, 3 corporals, 1 drummer, 2 fifers, and 53 privates, and for those who may be retired during the year		24,654.63
Undrawn clothing:		
Payment of discharged soldiers for clothing undrawn		25,000.00
Mileage:		
Mileage to officers traveling without troops		9,000.00
Commutation of quarters to officers on duty without troops where there are no public quarters		4,5[illegible]
PAY OF CIVIL FORCE.		
In the office of the colonel commandant:		
1 chief clerk, $1,540.80 (increase $59.20 submitted)		1,600.00
1 messenger at $80.94 per month		971.28
NOTE.—Increase of $59.20 submitted in order to give all chief clerks the same rate of pay ($1,600.)		
In the office of the adjutant and inspector:		
1 chief clerk $1,540.80 (increase $59.20 submitted)		[illegible]
1 clerk		[illegible]
In the office of the paymaster:		
1 chief clerk		[illegible]
1 clerk		[illegible]
1 clerk		[illegible]
In the office of the quartermaster:		
1 chief clerk $1,540.80 (increase $59.20 submitted)		[illegible]
1 clerk		[illegible]
1 clerk		[illegible]
In the office of the assistant quartermaster, Washington, D. C.:		
1 clerk		[illegible]
In the office of the assistant quartermaster, Philadelphia, Pa.:		
1 clerk		[illegible]
1 messenger, at $1.75 per diem		[illegible]
Total pay of civil force		[illegible]
Total amount to be appropriated under each head of appropriation		[illegible]
Amount appropriated for the current fiscal year ending June 30, 1894		[illegible]

ESTIMATES, QUARTERMASTER, MARINE CORPS.

HEADQUARTERS U. S. MARINE CORPS,
QUARTERMASTER'S OFFICE,
Washington, D. C., July 28, 1893.

SIR: I respectfully submit the annual estimates for the support of the quartermaster's department, U. S. Marine Corps, for the fiscal year ending June 30, 1895, calling your attention to the fact that the amount asked for in this estimate is $7,600 less than the amount appropriated for the present fiscal year.

Increases under some heads are made, and decreased amounts are asked for under others, as follows:

Provisions (same).	
Clothing (increased)	$5,000
Fuel (same).	
Forage (same).	
Military stores (same).	
Transportation and recruiting (same).	
Repair of barracks (decreased)	12,600
Hire of quarters (same).	
Contingent (same).	

Total amount appropriated under the act of Congress approved March 3, 1893, for the above items, fiscal year 1893-'94, was $271,810.50; amount asked for in present estimate for same objects, fiscal year 1894-'95, $264,210.50. Decrease, fiscal year 1894-'95, as compared to fiscal year 1893-'94, $7,600.

Clothing.—The increase of $5,000 is explained as follows: A new uniform for the enlisted men of the Corps having been recommended by a board of officers, and recommendations relating thereto having been approved and ordered to be carried out by the honorable the Secretary of the Navy, we found it impossible, owing to the lack of sufficient appropriation, to fully equip the men ashore, and therefore did not attempt to equip those aboard ships. To fully uniform the entire Corps the increase of $5,000 is necessary.

Attention is invited to the appended letter of Capt. R. S. Collum, assistant quartermaster, U. S. Marine Corps, in charge of the depot of supplies, Philadelphia, Pa., and his report of the distribution of clothing made during the fiscal year 1892-'93, marked A and B, respectively.

The barracks at Sitka, Alaska, were erected and occupied by the enlisted men during fiscal year 1891-'92, and is a small frame structure divided into two dormitories, a kitchen, mess room, and clothing room. The difficulty in obtaining suitable quarters for the use of the officer in command of that place, and the absolute necessity that exists for him to be as near to his command at all times as may be possible, made it desirable that he be allowed to temporarily occupy a portion of the barracks. In so doing, however, the air space intended for the enlisted men (as established by Army Regulations) has been curtailed. The space thus occupied by the officer in command is needed for a dormitory, library, and recreation room for the troops. I have therefore included in the estimates the sum of $2,500, for the purpose of erecting suitable officers' quarters at the Sitka post.

Reports of boards of survey upon the marine barracks and other public buildings at Brooklyn, N. Y., on file in this office, specify the character of certain repairs absolutely necessary there, as well as to repairs to the water pipes, and for that purpose a special estimate of $5,000 is included.

The general estimate of $10,000 for "repairs of barracks" at the different posts will not admit of performing the work required at Brooklyn, above referred to.

Very respectfully,

H. B. LOWRY,
Major and Quartermaster, U. S. Marine Corps.

The COLONEL COMMANDANT U. S. MARINE CORPS,
Headquarters.

ASSISTANT QUARTERMASTER'S OFFICE, U. S. MARINE CORPS,
Philadelphia, Pa., July 10, 1893.

SIR: I have the honor to submit herewith a statement showing the money value of the clothing supplied from the depot during the fiscal year ending June 30, 1893.

Clothing amounting in value to over $79,000 has been expended by me in only partly filling the requisitions made during the year. The unfilled requisitions on file here call for clothing of the value of more than $20,000.

You will perceive from the above that it is utterly impossible for this office to meet the demands made on it for clothing with the limited appropriation of $75,000.

I respectfully request that you will urge upon Congress the necessity of increasing the appropriation for clothing, Marine Corps, from $75,000 to $90,000.

Very respectfully,

RICH'D. S. COLLUM,
Captain and Assistant Quartermaster, U. S. Marine Corps.

Maj. H. B. LOWRY,
Quartermaster, U. S. Marine Corps, Washington, D. C.

ASSISTANT QUARTERMASTER'S OFFICE, U. S. MARINE CORPS,
Philadelphia, Pa., July 10, 1893.

SIR: I have the honor to report that during the fiscal year ending June 30, 1893, I have shipped from this depot, in filling or part filling requistions made upon me, clothing representing a money value of $79,151.90, viz:

July, 1892	$1,665.75
August, 1892	8,963.52
September, 1892	12,731.48
October, 1892	7,607.21
November, 1892	11,636.66
December, 1892	10,645.40
January, 1893	4,826.07
February, 1893	6,429.61
March, 1993	6,033.09
April, 1893	2,883.69
May, 1893	2,339.30
June, 1893	3,692.26
Total	79,451.64

Very respectfully,

RICH'D S. COLLUM,
Captain and Assistant Quartermaster, U. S. Marine Corps.

Maj. H. B. LOWRY,
Quartermaster, U. S. Marine Corps, Washington, D. C.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1895, by the Quartermaster's Department, U. S. Marine Corps.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
PROVISIONS.			
For 1,100 noncommissioned officers, musicians, and privates, and for commutation of rations to 11 enlisted men detailed as clerks and messengers, also for payment of board and lodging of recruiting parties, said payment for board not to exceed $2,500	$74,661.55		
For amount required to be transferred to appropriation pay Marine Corps, on account of rations to retired men and those that may be retired	5,338.45	$80,000.00	$80,000.00
NOTE NO. 1.—The commutation in lieu of rations in kind at the rate of $1.75 to these enlisted men; also commutation of quarters, at $21 and $10 per month, authorized by order of the Navy Department dated June 20, 1889 and July 30, 1885.			
NOTE NO. 2.—There are 65 retired enlisted men at this date.			
CLOTHING.			
For 2,100 noncommissioned officers, musicians, and privates		80,000.00	75,000.00
FUEL.			
For heating offices, barracks, and quarters; ranges and stoves for cooking; fuel for enlisted men; for sale to officers; maintaining electric lights, and for hot air closets		19,500.00	19,500.00
MILITARY STORES.			
For pay to chief armorer, at $3 per day; 3 mechanics, at $2.50 each per day—in all	3,286.50		
For purchase of military equipments, such as cartridge-boxes, bayonet-scabbards, haversacks, blanket-bags, knapsacks, canteens, musket-slings, swords, drums, trumpets, flags, waist-belts, waist-plates, cartridge-belts, sashes for officers of the day, spare parts for repairing muskets, purchase of ammunition, purchase and repair of instruments for the band, purchase of music and musical accessories, medals for excellence in gunnery and rifle practice, good-conduct badges, incidental expenses in connection with the school of application, signal equipments and stores, binocular glasses, for the establishment and maintenance of targets and ranges, for hiring established ranges, for procuring and handling ammunition, etc	10,000.00	13,286.50	13,286.50
TRANSPORTATION AND RECRUITING.			
For transportation of troops and the expenses of the recruiting service		15,000.00	15,000.00
REPAIR OF BARRACKS.			
At Portsmouth, N. H.; Boston, Mass.; Newport, R. I; Brooklyn, N. Y.; League Island, Pa.; Annapolis, Md.; Headquarters and Navy-Yard, Washington, D. C.; Norfolk, Va.; Pensacola, Fla.; Mare Island, Cal.; Port Royal, S. C.; and Sitka, Alaska, and per diem for enlisted men employed under the direction of the Quartermaster's Department on the repair of barracks and other public buildings	10,000.00		
For alteration and repair of marine barracks and other public buildings, repair of parade ground, relaying walks and gas and water pipes at navy-yard, Brooklyn, N. Y	5,000.00		
For rent of building used for manufacture of clothing, storing supplies, and office of assistant quartermaster, Philadelphia, Pa	2,000.00	17,000.00	29,600.00

Estimates of appropriations required for the service of the fiscal year, etc.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1894.
FORAGE.			
For forage in kind for 5 horses of the Quartermaster's Department and the authorized number of officers' horses		$2,800.00	$2,800.00
HIRE OF QUARTERS.			
For hire of quarters for officers serving with troops where there are no public quarters belonging to the Government, and where there are not sufficient quarters possessed by the United States to accommodate them	$4,500.00		
For hire of quarters for 7 enlisted men employed as clerks and messengers in commandant's, adjutant and inspector's, paymaster's, and quartermaster's offices, Washington, D. C., and assistant quartermaster's office, Philadelphia, Pa., at $21 each per month	1,764.00		
Hire of quarters for 3 enlisted men employed as above, at $10 each per month	360.00		
		6,624.00	6,624.00
CONTINGENT.			
For freight, ferrriage, tolls, cartage, funeral expenses of marines, stationery, telegraphing, rent of telephones, purchase and repair of typewriters, apprehension of stragglers and deserters, per diem of enlisted men employed on constant labor for a period of not less than ten days, repair of gas and water fixtures, office and barracks furniture, mess utensils for enlisted men, such as bowls, plates, spoons, knives and forks, packing-boxes, wrapping paper, oilcloth, crash, rope, twine, camphor and carbolized paper, carpenters' tools, tools for police purposes, iron safes, purchase and repair of public wagons, purchase and repair of harness, purchase of public horses, services of veterinary surgeons and medicines for public horses, purchase and repair of hose, repairs of fire extinguishers, purchase and repair of lawn mowers, purchase of fire hand grenades, purchase and repair of carts and wheelbarrows, purchase and repair of cooking stoves, ranges, stoves, and furnaces, where there are no grates, purchase of ice, towels, and soap for offices, postage stamps for foreign postage, purchase of books, newspapers, and periodicals, improving parade grounds, repair of pumps and wharves, laying drain, water, and gas pipes, water, introducing gas, and for gas and gas oil, and maintenance of electric lights, straw for bedding, mattresses, mattress covers, pillows, wire bunk bottoms for enlisted men at the various posts, furniture for Government houses and repairs of same, and for all emergencies and extraordinary expenses arising at home and abroad, but impossible to anticipate or classify—in all		30,000.000	30,000.00
		264,210.50	271,810.50

HEADQUARTERS MARINE CORPS,
QUARTERMASTER'S OFFICE,
Washington, D. C., October 16, 1893.

Schedule of proposals for supplies for the Marine Corps under advertisement inviting proposals, dated March 6, 1893.

Name.	Class.	Amount.
U. G. Fox	1, 2, 3	*$11,871.26
H. D. Dougherty	1	*1,308.42
White & Dodson	4	*1,642.56
H. T. Kent	1	*32,330.00
H. Hemken	1, 2, 3	*9,148.55
W. F. Bernstein	1	*1,564.50
S. W. Keith	1	2,968.00
G. F. Rodel	1	*6,894.00
J. A. Joel	1	2,282.50
Lyons Bros	1	*550.00
R. J. Lennon	1	605.00
R. Lovick Sons & Co	1	*606.00
J. Galbraith	4	*512.50
R. Wurlitzer	2	180.13
Liberty Woolen Manufacturing Co	1	11,305.00
Hartford Woven Wire Mattress Co	1	1,029.50
H. C. Harper	1, 2, 3	*7,124.77
Horstmann Bros. & Co	1, 2, 3	*11,401.71
W. Breuninger	2	600.00
Manhattan Supply Co	1, 2, 3	*14,433.63
Shoemaker & Busch	4	*471.55
J. W. Pepper	2	187.65
Watsontown Boot and Shoe Co	1	7,164.00
F. W. Allison	4	428.75
Cavanaugh and Thompson	4	*821.25
Wendell, Fay & Co	1	17,170.00
B. Rich & Son	1	3,538.50
B. Y. Pippey & Co	1	*25,282.50
Paul J. Field	4	*757.22
Louis Sichel	1	812.00

* Accepted for part of class.

Schedule of proposals received for supply of rations for the Marine Corps, for the year 1895, under advertisement from the quartermaster's office, dated March 6, 1893.

Names of contractors.	Portsmouth, N. H.	Charlestown, Mass.	Brooklyn, N. Y.	Philadelphia, Pa.	Washington, D. C.	Gosport, Va.	Annapolis, Md.	Port Royal, S. C.	Mare Island, Cal.	Sitka, Alaska.	Chicago, Ill.
P. J. Carmondy			*$15.57								
H. R. Paul	*$18.69										
C. A. Simonds		*$14.47									
J. Brownlie									$19.85		
Megarry & Co									*17.40		
J. B. Bryan & Co.	23.73	25.73		$31.50	$24.68		$23.73				
F. Hume	22.12	24.74		29.73	21.73		19.93		25.60		
J. C. Ergood & Co.	21.74	22.68		*28.72	22.68	$22.75	20.00				
W. H. Belford	25.50	24.73	15.93	30.00							
A. Koch			26.00								
D. V. Miller							*19.50				
T. J. Barlow						18.64					
Harrington Bros.	21.00	15.73									
J. T. Parker & Bro						*18.00					
C. S. Hewlett		18.75									
W. E. Campbell								*$38.00			
C. S. Hewlett			16.75								
M. L. Kelly									17.90	*$45.00	
G. Ahernes & Son			15.80								
C. S. Hewlett					*19.75						
Robert Greer											$72.00

* Accepted.

Schedule of proposals received for supply of wood and coal to the Marine Corps, under advertisement of the Quartermaster's office, dated March 6, 1893.

Names of bidder and where to be delivered.	Wood (per cord).			Coal (per ton).					
	Oak, in stick.	Pine, in stick.	Pine (kindling), sawed and split.	Red ash (egg).	Red ash (stove)	White ash (egg).	White ash (stove)	White ash (furnace).	White ash (nut).
Marine Barracks, Portsmouth, N. H.:									
S. G. French	......	......	......	......	......	*$6.24	......	*$6.24	......
E. C. Spinney	*$6.90	$4.50	$5.00	......	......	......	......	......	......
C. E. Walker & Co	8.50	7.50	10.00	......	......	6.40	......	6.40	......
Marine Barracks, Charlestown, Mass.:									
S. G. French	......	......	......	......	......	6.94	$6.94	6.94	$*6.94
C. A. Campbell	*9.00	*8.00	*10.00	......	......	6.75	6.75	6.38	6.38
J. J. Convery	12.00	12.00	13.00	......	......	8.50	8.50	8.50	8.50
G. M. Winslow & Co	12.00	8.00	12.00	......	......	*5.95	*6.20	*5.95	*6.20
Marine Barracks, Brooklyn, N. Y.:									
M. Morganstein	*8.74	......	......	......	......	......	......	......	......
S. G. French	......	......	......	......	......	*4.44	......	......	4.94
Moquin & Offerman	......	......	......	......	......	4.60	......	......	*4.60
J. J. Convery	12.00	*12.00	*13.00	......	......	5.69	......	......	5.69
D. Duncan & Son	......	......	......	......	......	4.93	......	......	4.93
Marine Barracks, League Island, Pa.:									
S. G. French	......	......	......	......	......	5.64	5.64	......	5.64
J. J. Convery	*12.00	*12.00	......	......	......	*5.49	*5.49	......	*5.49
Offices and officers' quarters, Philadelphia, Pa.:									
J. J. Convery	*12.00	......	*13.00	......	*$5.47	*5.37	......	......	......
Marine Barracks, Annapolis, Md.:									
H. B. Myers	*4.00	*3.40	*5.00	......	5.90	5.30	*5.40	......	......
J. S. M. Basil	4.37	3.87	5.44	......	5.98	*5.24	5.74	......	......
J. B. Flood	5.23	4.23	5.40	......	*5.75	5.45	5.60	......	......
Offices and officers' quarters in Washington and Georgetown, D. C., and within 1 mile of limits of said cities:									
J. Z. Williams	*5.25	*5.00	*6.00	*$6.10	*6.10	*5.50	*5.60	*5.30	*5.50
Marine Barracks, Navy-Yard, Washington, D. C.:									
J. Z. Williams	*5.00	*4.90	......	......	......	*5.30	*5.50	*5.30	*5.35
Marine Barracks, Norfolk, Va.:									
E. C. Brooks & Co	6.10	......	......	......	......	......	7.15	......	......
W. & J. Parker	*6.00	......	*6.00	......	......	*6.75	*6.25	......	*6.25
Nottingham & Wrenn Co	......	......	......	......	......	7.55	6.98	......	6.35
Officers' quarters, Norfolk, Va.:									
E. C. Brooks & Co	6.10	......	......	......	......	......	7.15	......	......
W. & J. Parker	*6.00	......	*6.00	......	......	......	*7.00	......	......
Marine Barracks, Mare Island, Cal.:									
S. G. French	......	......	......	......	......	12.90	......	......	......
Aden Bros	9.00	9.00	10.00	......	......	*11.45	......	......	......
W. Walker	*7.95	*7.95	*9.00	......	......	12.96	......	......	......

*Accepted.

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